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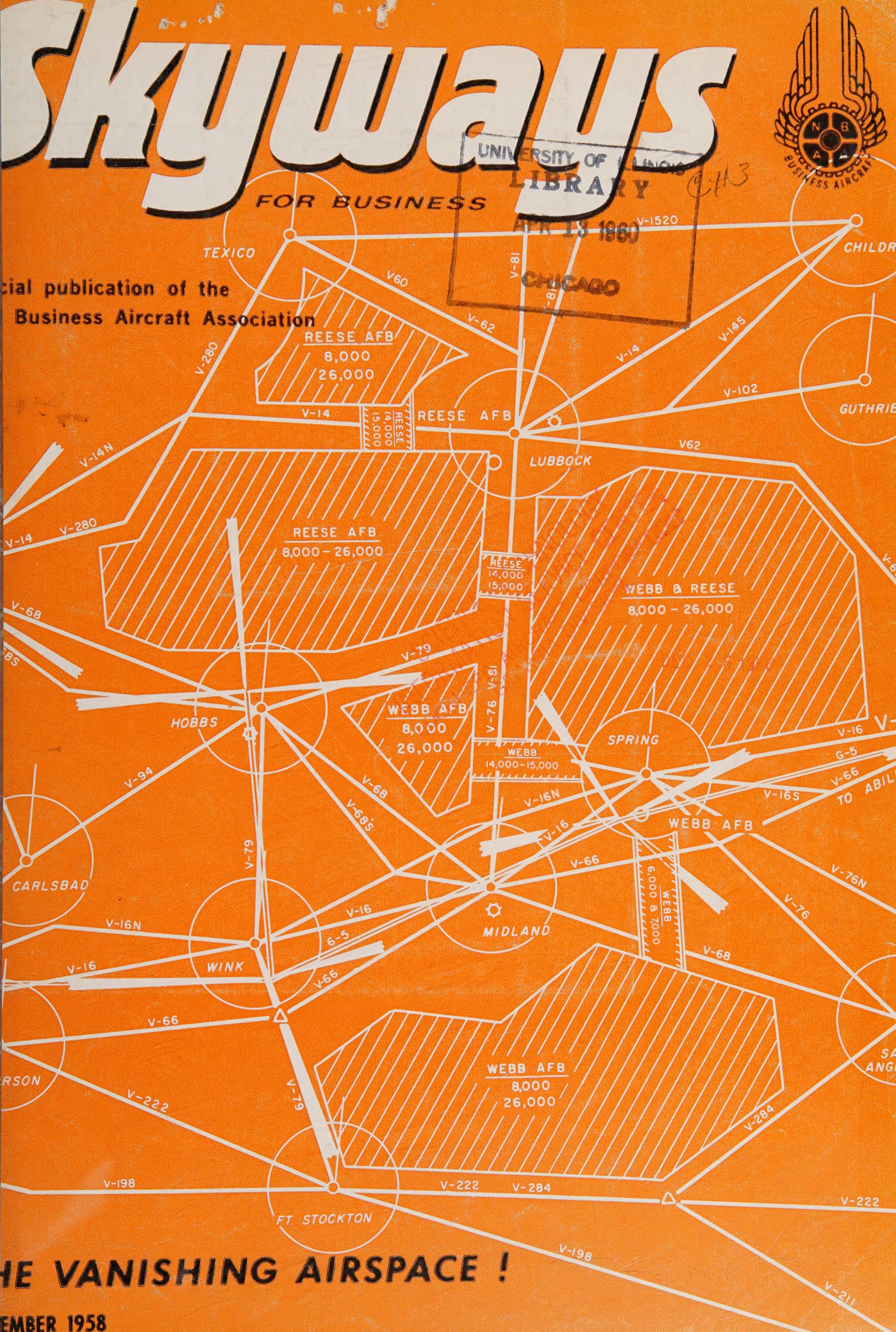

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EMBER 1958

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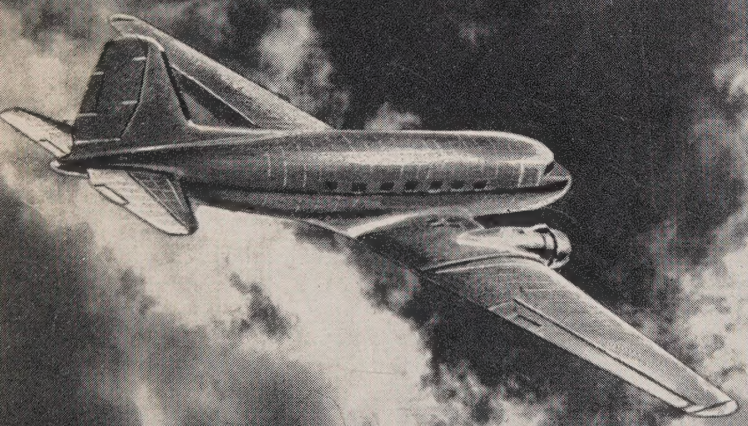

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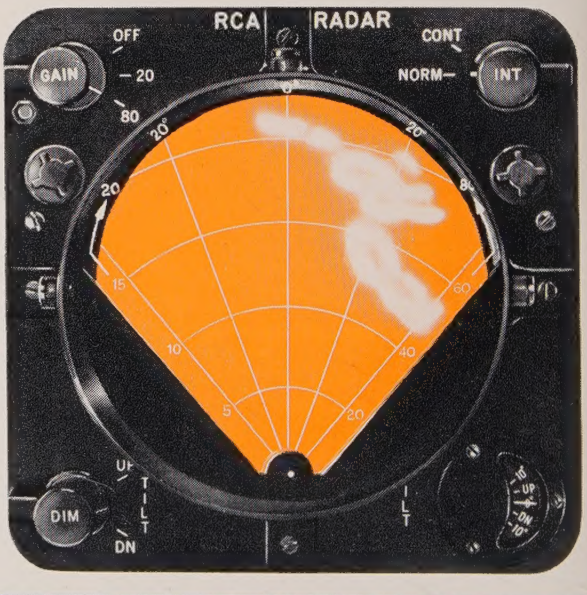

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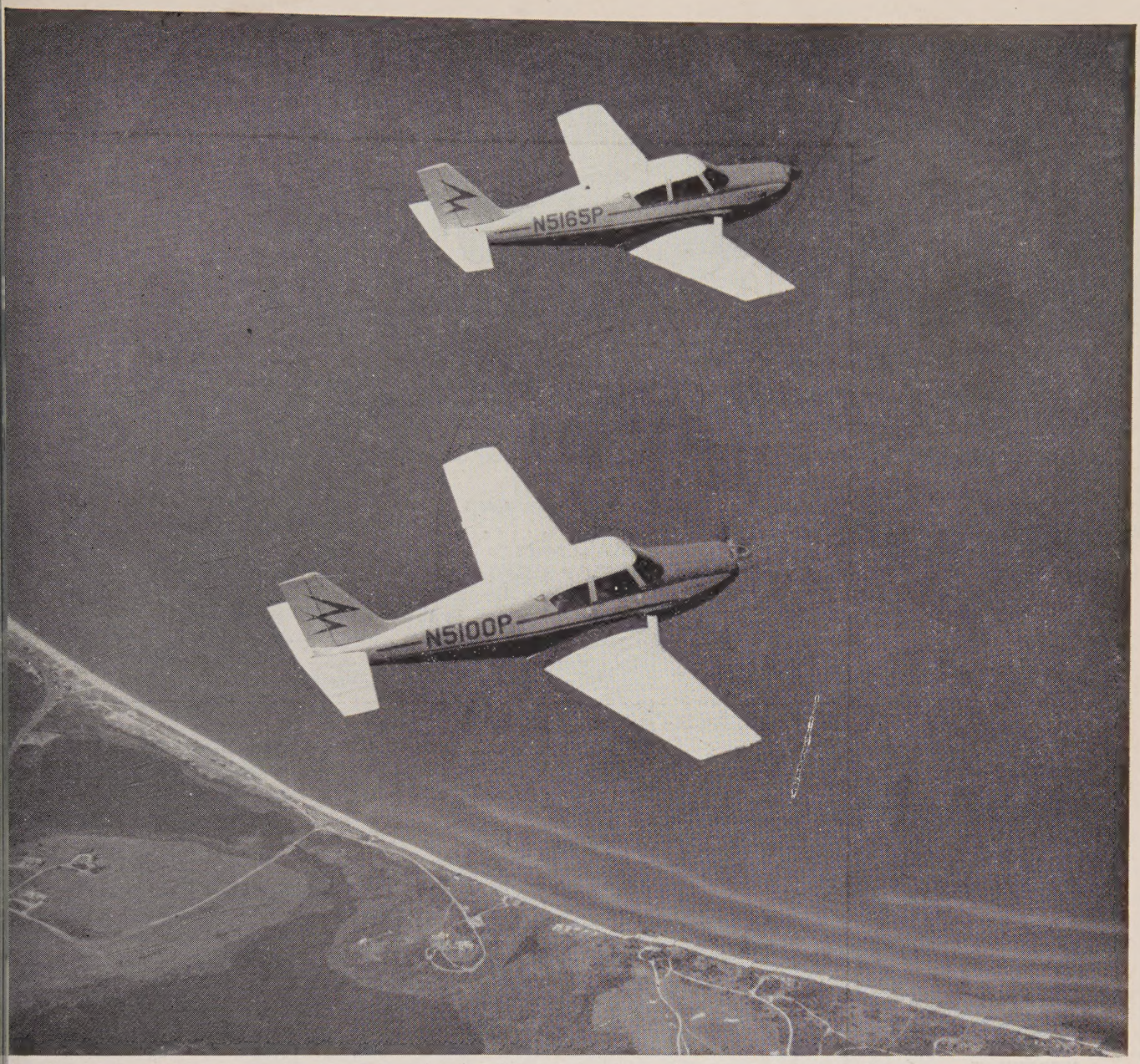

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DECEMBER, 1958

Skyways FOR BUSINESS

The official publication of the National Busniess Aircraft Association

COVER: The Vanishing Airspace—The eternal conflict between defense needs of our nation and maximum economic and public use of our national resources is dramatically illustrated by the rapid encroachment of military Restricted Airspace. The now well-publicized Texas-New Mexico case illustrates the problem civil aviation is facing all over the country. Cover chart shows dog-legging and recission of airways (astride major east-west routes) awaiting Washington approval.

Aviation Roundup 6
Editorial 9
NBAA Director's Notes 10
The Case (1674) in Point . . . . . W. K. Lawton 11
Crossing the Rio Grande . . . . . Emile Zubryn 14
Complete Service to Corporate Operators 15
"Flying Hospital" . . . . . Don Downie 16
Flight Path Computer . . . . . Joe Bush 18
The Weather Bureau's Five-Year Plan 21
Try Sand in Your Shoes . . . . . Ruth Freckleton 27
March of Dimes Airlift 30
Defense Needs Vital to FAA Operations Structure . . 34
Controllers Convene on Airways Problems 34
Flattops on the Ground . . . . . Albert S. Burchard 49

NAVICOM

Fifty-Eight Dash Five—Why? 24
VORTAC Order Speeds Short Range NAV Program 25
Aircraft Electronics Assn. Backs 58-5 26

Air Your Views 5
Helicopters 22
Law Behind the Skyways 41
Greenhouse Patter . . 41
Safety Digest 44
Business Hangar . . . 50
Canadian Report . . . 54
Nu-Avi-Equip 56
Maintenance 58

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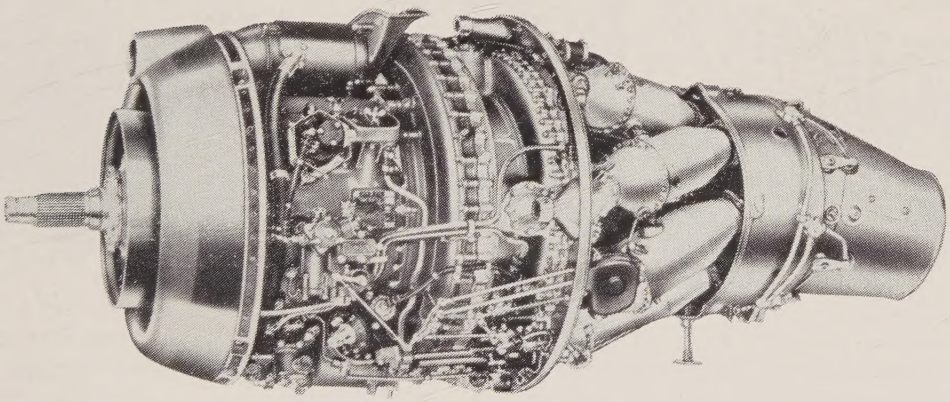

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AIR YOUR VIEWS

PASS THE WORLD ALONG

Gentlemen:

Would you have any objection to our distributing thermofax copies of an article in the October issue of Skyways regarding C-47 fuel system (Safety Digest, page 74) to personnel who maintain and fly Civil Aeronautics Administration owned DC-3 (C-47) aircraft? Excellent information.

John P. Morris
Chief, Aircraft Control Div.
CAA, Washington, D.C.

(Definitely not—Ed.)

DOMESTIC RELATIONS COURT

Dear Boss-driver,

Enclosed is addenda to DEC Greenhouse Patter (page 41). I am also enclosing a do-it-yourself tool (red pencil) to rend said addenda, as your supply (judging from the way you have hacked my copy for the last six months) must be dangerously near the "red line."

Thine,
Torch Lewis

(In defense, we would like our readers to know we keep a bucket of water handy to immerse Torch's unexpurgated copy on receipt before editing!—Ed.)

AIR SPACE CONTROVERSY

Dear Mr. Graham,

Thank you for the completed airspace user questionnaire . . . and remarks indicating the very keen interest of your staff in the air space problem. (See cover caption and The Case (1674) in Point, pg. 11.)

We feel that CAA acceptance of our recommendation of a 12,000-foot floor for the Air Force Jet Training Program (West Texas and New Mexico case) is a major victory for private and commercial aviation interests.

We are greatly pleased to know that your fine publication is included in our ranks.

J. F. Maddox, chairman
Lea County Airport Committee,
Hobbs, New Mexico

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NBAA

PLEASED PILOT

Dear Mr. Graham,

I was thrilled by the comments of friends at a QB meeting about the Skyways' story (October, p. 46) of my use of a private plane in connection with my business activities. . . .

It's a nice story and I appreciate the honor—particularly in a book read by all the pros, so many of whom are my close friends. Many thanks.

Virgil LaMarre
Bloomfield Hills, Mich.

MORE VAN NUYS APPRECIATION

Dear Mrs. Henry,

I want to express . . . the appreciation of the Los Angeles Department of Airports for the excellent article about our Van Nuys Airport which appeared in the August, 1958, issue of Skyways.

(It) gave evidence of an understanding of the problems involved in business aviation. It is certainly gratifying for people in airport management work to have their efforts recognized. We have tried to provide the best possible facilities for the tremendous field of business flying at our airports.

Francis T. Fox, Ass't. Gen'l. Mgr.
Dept. of Airports, Los Angeles, Calif.

IT'S NEW! *You ride on air!*

FEDERAL *Airglide* SKIS

Another significant advance in aircraft skis by Federal! The new AIRGLIDE combination wheel-ski utilizes the resilience of the aircraft tire to produce an *air ride* landing and take-off run over rough areas of wind-packed snow. When the ski is in the "down" position, the tire rests on the upper surface of the ski board. This cushioning effect is immediately apparent to the operator as most of the stress and strain on the aircraft previously associated with this type of terrain is now absorbed by the tire. It is aerodynamically faster too because now, all of the hydraulic mechanism is enclosed within the ski channel. As in previous Federal wheel-ski models, hydraulic controls permit use of wheels alone on dry runways.

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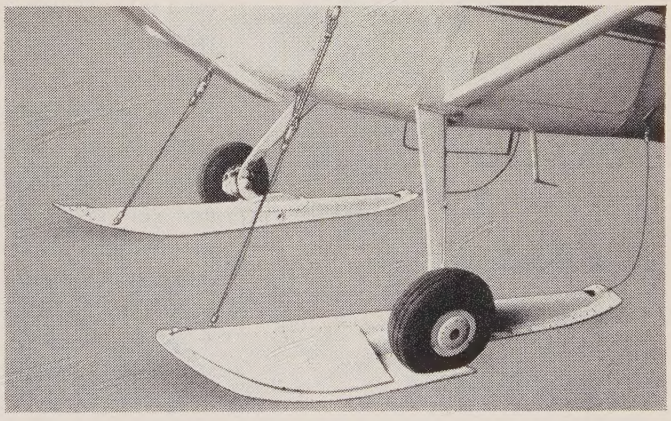

Truly, a MULTI-PURPOSE SKI!

Available with or without hydraulic controls

With hydraulic controls, the AIRGLIDE ski can be raised or lowered either in flight or on the ground by means of a single control in the cockpit. For the operator who does not require hydraulic actuation, this new Federal ski is available without hydraulic controls . . . *at a considerable saving.* This improved version of the fixed position ski gives the owner the advantages of the air cushioning effect *plus* the greater utility of wheel operation for use on bare runways. The skis are manually actuated while on the ground and secured in either "up" or "down" position.

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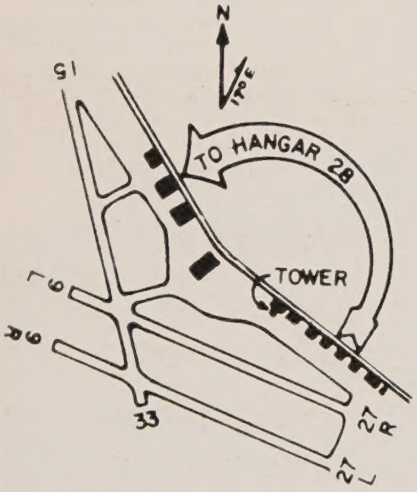

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Circle No. 6 on Reader Service Card

Aviation Roundup

FAA PERSONNEL STRUCTURE LEGISLATION ADVANCED from January 1960 to opening of next Congress. Absorption of military ATC personnel is an imposing requirement to protect by legislation against loss of personnel in time of national emergency. Fordyce Luikart, Dir. FAA Organization Study, indicated that enlisted military ATC personnel may come in as civilians at journeyman level and commissioned may come in at supervisory levels retaining rank status. Defense Dept. type regulations may be applied to new organization personnel (See FAA . . . Defense Needs, Pg. 38.)

★ ★ ★

RADAR TRAFFIC ADVISORY AND VECTORING SERVICES FOR CIVIL AIR CARRIER JETS operating above 24,000 feet, announced by FAA Admin. Pete Quesada, will be watched closely by all civil aviation. Commendable attack on problem of high altitude visual inadequacies of unaided human eye may help develop techniques for greater safety at lower altitudes. Meanwhile professional civil air traffic controllers suggest advisability of requiring military radar operators to be fully-ATC qualified in view of known limitations of current radar equipment. (See Controllers Convene . . . Pg. 38.)

★ ★ ★

NORTH AMERICAN AVIATION'S SABRELINER ordered by Air Force for evaluation. Flying prototype carries four passengers plus two-man crew. The executive-type jet plane has potential civil market in business aviation. Twin engines are G.E. J-85s. (See SKYWAYS, September 1958, page 16.)

★ ★ ★

CESSNA AND AIRCRAFT RADIO CORP. PLAN MERGER subject to approval of stockholders of both companies. Details not developed, but by basic agreement each ARC stockholder to receive two shares of Cessna stock for each three shares of ARC stock. Cessna intends ARC to continue present operations.

★ ★ ★

TACAN PORTION OF VORTAC reported not shaping up as accurate as VOR despite early claims and much redesigning, says NPA (National Pilots Association). This contrasts with enthusiastic military reports of Alaskan and Naval experiences. NPA further reports that Federal Telephone & Telegraph (TACAN developers) have a DME-T ground station design which could be added to present and future VOR's at 10% of the current cost of converting VOR's to VORTAC's. Similarly, there are now available TSO'ed packages VOR's that can be installed for less than 30% of current typical installations. Size and cost reduction of airborne equipment proceeding routinely.

★ ★ ★

"YOU ARE NEVER RIGHT" DEPT: SAFETY MOVE BY CAA/FAA combining CAA and military radar to safeguard civil airline jets criticized by Airline Pilots Association as unduly restrictive on pilots by denying them use of *all* available airspace to render safe flight to their passengers.

★ ★ ★

TURBOPROP ENGINE OVERHAUL FACILITIES ON WEST COAST assured purchasers of Fairchild F-27, Grumman Gulfstream and Vickers Viscount by Rolls-Royce (Dart) appointment of Pacific Airmotive at Burbank. All models of Dart engines and accessories will be overhauled, repaired and tested under first such Rolls-Royce of Canada arrangement with a private maintenance company.

Aviation Roundup

DEATH OF 58-5 (IFR EQUIP ENVIRONMENT STANDARDS PROPOSAL) in present form assured at press time. Of paramount interest to all general aviation is understanding that FAA Administrator Quesada *favored* pigeonholding at this time for further study (See NBAA Dir. Notes—Nov. and Acft Electr. Assoc., Pg. 26 this issue). This could also mean a good quality of teamwork between Quesada and incumbent CAA Administrator Pyle, general aviation's choice for FAA Deputy.

★ ★ ★

HIGH VISIBILITY PAINT SAFETY PROGRAM GIVEN ADDED IMPETUS by CAA finding of increased conspicuity in both sunlight and overcast conditions at critical ranges under three miles. Further test indications suggest that optimum coverages of 15 to 20 percent featuring large areas on wing tips, tail assembly and nose areas indicated by fact that 90% midair collisions are side and rear conversion angles.

Value of this effort as an immediately available safety factor is confirmed by Air Force decision to mark 13,000 non-tactical aircraft with DAY-GLO Blaze Orange, Coast Guard to mark all their aircraft with BOLD Safety-Sight Yellow-Orange. Latter points up additional factor to that of anti-collision safety, the long-recognized value in spotting aircraft on water or ground, a significant bonus to quicker air-sea rescue operations.

Glidden has added considerable weight to the field with VISMATIC fluorescent colors. With the military and general aviation well in the lead in adopting this immediate step to greater safety, the industry and flying public is regarding closely the airline pilots' and companies' apparent preference for "black box" development programs and airspace restrictive measures (insistence on IFR procedures below five miles visibility—already officially rejected by CAB as conclusively unrelated to collision records). Speed control related to visibility and traffic area density hinted by CAB may be another reason.

★ ★ ★

AIRLINE PILOTS LOOK TO HIGH-INTENSITY EXTERIOR LIGHTING FOR DAYTIME ANTI-COLLISION SAFETY pointing out availability of such systems as Atkins (airline pilot developed) Relative Danger Area Light (SKYWAYS Mar. 1956). At ALPA Miami Convention stressed need for visual means of locating aircraft as well as continuing "black box" (Proximity Warning) development (See p. 46.)

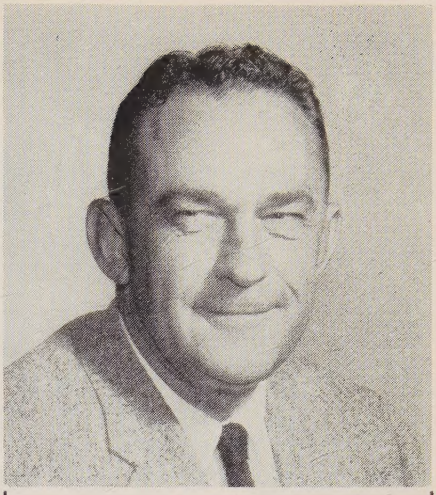
★ ★ ★

BUSINESS AIRCRAFT OUTFLEW DOMESTIC SCHEDULED AIRLINES in 1957 by more than one million hours, James T. Pyle, CAA Administrator, revealed. General aviation flew 10.9 million hours and traveled 1,400 million miles. Domestic scheduled airlines flew 3.6 million hours and total of 785 million miles. Business aircraft flew 4.9 million hours in 1957, nearly two and one-half times the two million hours flown in 1947.

A late CAB study revealed that, compared to a scheduled carrier statistic of 3.78 passenger fatalities per 100,000 hours, executive flying rate was 1.12 (2.14 rate for aircraft over 12,500 lbs and others 0.81) per same hours.

★ ★ ★

LOW-COST, FOUR-PLACE, EXECUTIVE HELICOPTER designed by Doman Helicopters. Estimated per seat-mile cost, 6.45¢. Estimated factory list price on basis of copter being deliverable within two years, $18,500. Doman believes the "significant" reduction in costs should make for greater utilization of "this type of vertical lift vehicle." Performance figures: cruise, 103 mph; climb, 1,500 fpm; hovering ceiling 6,300 ft; service ceiling, 15,000 ft.



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If you're racing out to get an autopilot *other* than a Federal, you either ought to wait a bit for Federal's new* "Freehand Flight" heading lock-on accessory or get the basic Federal Autopilot now and plug in the rest whenever your pocketbook says "Go"!

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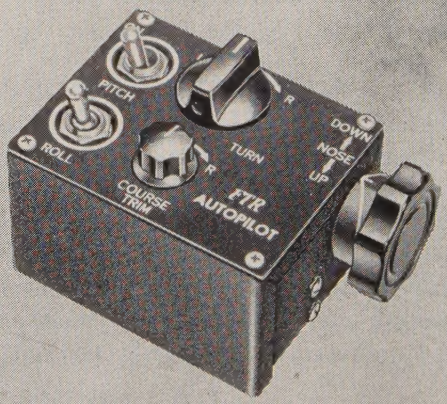

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Editorial

BUSINESS AVIATION IS AN INTEGRAL PART OF NATIONAL DEFENSE

The professional, career military airman represents one of the most dedicated types of mankind ever to be encountered. His sole purpose in life, or death, is to be of service to his country, to exert his every effort to see that the military organization is at maximum efficiency, to combat any person or thing, derogating the military might of his country.

The patriotic fervor, the ardent zeal of professional military airmen meet every concept of what we—as a nation—must have to survive.

In their patriotic fervor and ardent zeal, these professional military airmen are prone—we have observed in our airspace dealings with them—to examine their professional military needs solely from within their own military organization as though the military organization was an entity unto itself.

There has not been a thorough military evaluation of what they term as an "Estimate of the Situation."

Reduced to its basic terms, the situation is this:

1. The United States must be militarily strong.
2. The strength of the military is dependent on its supplies from U.S. industry.
3. U.S. industry, as suppliers to the defense establishment, uses large numbers of aircraft (over 30,000 airline and business aircraft) in supporting the management of industry.
4. Any great restrictions on the civilian use of air space can only result in the eventual slowing down of industry's ability to produce supplies for the military.
5. If the support of the military establishment is not maintained, the military establishment becomes weaker and ineffectual.
6. If the military establishment becomes weak and ineffectual we then oppose our original contention that "The United States must be militarily strong."

A further omission in the professional military team thinking—at least as evidenced by their spokesmen—is the fact that in general aviation there remains a strong reserve force in being.

What other country can boast of 60,000 aircraft in its inventory not dependent on governmental funds for their daily operation?

What other country has 809,349 licensed airmen, the great majority of whom are not on the government payroll, directly or indirectly.

What other country has more than 3,500 aircraft maintenance shops with thousands of skilled technicians who are not directly dependent on the government funds.

This great civilian fleet of aircraft and their supporting services not only operates without government subsidy, it goes even further . . . it is a great source of revenue to the government.

These are facts that the professional military man must realize as he equates his airspace necessities. These are the facts that can directly affect his sole mission as a dedicated military officer. These are the facts, when accepted by the military, which will result in military strength instead of weakness.

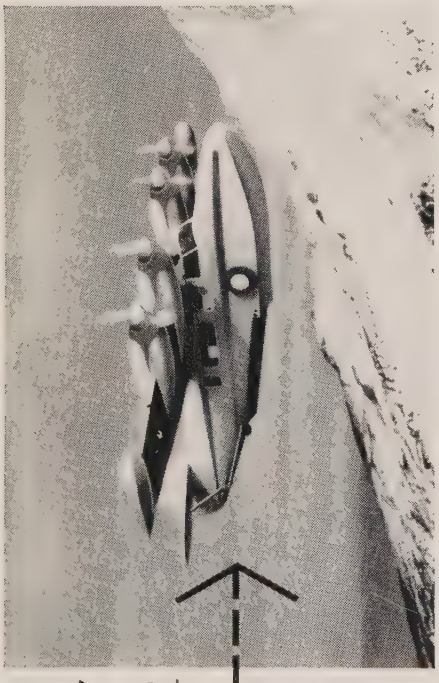
These facts must be considered on all apportionments of airspace because *business aviation is an integral part of national defense.*

HARTZELL CONSTANT SPEED, FEATHERING AND REVERSING PROPELLERS help make the 4-engine McKinnon Conversion Goose a most versatile high performance executive aircraft.

- 3-blade propellers for smoothness and minimum noise.
- Constant speed for maximum performance in take-off, climb, and cruise.
- Feathering for engine out safety.
- Reversing for water handling and backing off of beaches, (or braking during landing).

HARTZELL PROPELLER, INC. Piqua, Ohio U.S.A.

Other Representative Hartzell Propeller Applications: Beechcraft, Cessna, Piper, Aero Commander, Helio.



Hartzell COVERS THE FIELD

Circle No. 9 on Reader Service Card

DIRECTOR'S NOTES

by Bill Lawton
Executive Director, NBAA

Airways Modernization Board, now officially part of the Federal Aviation Agency, has awarded one contract, and proposed two more contracts the results of which will have far-reaching effects on all U.S. aviation.

The first contract, awarded to the Booz, Allen and Hamilton firm of Chicago calls for them to make a survey in three areas:

1. To prepare nationwide figures indicating the number of aircraft movements (takeoffs and landings) of the military, air carrier and general aviation fleets at present and for a period in the future through 1980.

2. To prepare nationwide figures indicating the number of instantaneous airborne aircraft in the military, air carrier and general aviation fleets and the totals for the present and in the future through 1980.

3. To prepare nationwide figures showing traffic flow (number of flights) between appropriate airports and/or airspace "cells" (see SKYWAYS, Sept. 1958, page 32) for aircraft in the three fleets.

The second contract will require a detailed technical review of the number and characteristics of airborne navigation equipments in use in the air traffic control environment, and the type aircraft in which they are installed.

Because air traffic control is only as good as its communications, AMB announced that a third contract will survey the numbers and characteristics of the different communications equipments both airborne and ground-based.

This type of factual information has been needed for many years.

This type of factual material NBAA has repeatedly requested from the Dept. of Commerce—to no avail. And CAA could assign no such funds without Commerce sanction.

These are the types of nationwide surveys that must be conducted so that the FAA can make a fair appraisal *before* introducing rules, regulations, legislation, policies, operating procedures which will affect all users.

Too much has been done in the past, particularly by certain governmental aviation "experts" in proposing regulatory changes without the faintest concept of the impact on the aviation community.

The attitude expressed was, "That's the purpose of the proposal, to find out from the users."

While this concept may have validity, the ultimate burden rested on the aviation community to prove the proposed regulation was out in left field.

Much of the resulting controversy could have and should have been avoided by nationwide surveys that are now under way and proposed by the AMB.

The better the story, the harder it is to verify its accuracy—this is a standard item in a reporter's life. This hard-to-rundown item is quoted from "unusually high government sources."

Seems that when the British yachtsmen brought the "Sceptre" to race against the U. S. "Columbia" in tthe oft-times turbulent, tricky tides of Long Island Sound, the Britishers approached someone in the U. S. hierarchy to ascertain if the experimental Decca system would be in operation during the race week.

When it was discovered that the Britishers planned to use the Decca system as a navigation aid during the race, they were told, the story goes, "Terribly sorry, but we understand that Decca is designed for aircraft use and we are not planning to use any aircraft with Decca on board during race week."

Results of the race indicate that the item that the "Sceptre" could have used most was not Decca—but JATO.

(Air Space Case FTW 1674—a precedent setting case—involves five large Air Force training areas. Here's a chronological history of the case that should be read by every business aircraft owner and pilot!)

THE CASE (1674) IN POINT

By W. K. Lawton
Executive Director, NBAA

Preparation of the airspace case, involving five large U.S. Air Force training areas in Texas, began on June 3, 1958, at a meeting which L. C. Elliott, CAA Regional Administrator held in Fort Worth, Texas, with CAA Members from CAA Regions Two, Three, and Four and representatives of USAF Headquarters and Air Training Command.

On this date, June 3, a team was appointed consisting of a representative of the CAA Air Traffic Control Division, Flight Operations and Airworthiness Division and representatives of the USAF Air Training Command and Headquarters, USAF. Starting June 4, the joint CAA/Military team worked together to provide methods of "segregating that air traffic which is not adaptable to control by Air Traffic Control."

It is to be noted here that *no* representatives on the CAA portion of the team were from the General Safety Division which is charged with knowledge of general aviation's activities. Nor was there representation permitted from any civil aviation organization—although it had been requested.

The joint CAA/Military team proceeded to the bases of the Air Training Command to study the actual operation of each base involved in the case: Webb AFB, Big Spring, Texas, and Reese AFB at Lubbock, Texas.

Here they applied the "ground rules" or criteria established by the CAA Administrator for teams studying segregation of military training activities.

On July 31, almost two months after the investigation was commenced, the CAA/Military team had presented their solution of the problem to the Fort Worth Regional Air Space Subcommittee. The secretary of that committee sent out the case "write-up" for consideration to Air Space Subcommittee members. This was one of 25 cases on the agenda for the meeting scheduled for August 20 in the Fort Worth CAA Regional offices.

When the meeting convened on August 20 and again on the 21st at Fort Worth, it became apparent that the CAA/Military team had run into difficulties and the Department of Commerce member requested that the case be deferred "for further study and expanded *justification* for the proposals."

It was also decided that a special meeting of the Fort Worth Regional Airspace Subcommittee would be held September 3 in Fort Worth to consider this case in its revised form.

At this time the local CAA Administrator took action to see that "interested parties" be advised of this gigantic air space problem.

On August 28, airport managers, aircraft operators and others considered interested parties received notice of this special meeting to be held September 3.

General aviation, in effect, was given *two working days* to prepare facts and figures to present for their argument. (A week-end plus Labor Day holiday intervened). Two working days were allowed to do a job that it took a skilled staff of CAA/Military experts almost two months of intensive work to prepare!

At the demand of general aviation interests the local administrator agreed to a two week's postponement.

So on September 18, Fort Worth Case 1674 was finally presented.

Read the case write-up as it was presented (page 13). It requests five areas to be set aside for Air Force training. These areas (see cover) were to begin at 8,000 feet above sea level (roughly 4,500 feet above ground) and continue upwards to 26,000 feet above sea level.

These areas were to be designated CONTROL/RESTRICTED AREAS. At first, the CAA/Military team had called them RESERVED areas, a new term which has no foundation in designation of air space. The designation RESERVED was withdrawn prior to the September 18 hearing.

Forty general aviation representatives were present—members of general aviation organizations, fixed base operators, airport managers, chambers of commerce and individual aircraft owners. One NBAA, one NASAO (state officials), one AAAE (Airport executives) and one AOPA representative were present as Associate members of the Regional Air Space Subcommittee. Two representatives of ATA (Air Transport Association) and one ALPA (airline pilots) were also present as Associate members.

Members of the Regional Airspace Subcommittee were: The Navy, represented by two Commanders; the Air Force, by two Majors; the Army, by one Major. The CAA was represented by the Regional CAA Administrator, and the government was further represented by a Civil Aeronautics Board staff member . . . a ratio of five military to two civil *voting members* (Associate members cannot vote).

The Navy, the Air Force, the Army, the CAA, the CAB, the air carriers were each represented by highly professional, paid staff experts.

Following the presentation of the case by the CAA Administrator, Major T. E. Yarbrough, representing the Air Force, made the following statement:

"It is not the interest of the Air Force to unduly restrict any segment of aviation, whether it be air carrier, general aviation, non-scheds, or what have you. It is the intent of the Air Force to conduct training that is required in our responsibility to the American people in the safest way we know how.

"Even though it may cause undue restriction on some of our operations, we are willing to accept these, but we do think it is necessary to accept such restrictions to prevent loss of life and money. We think the areas requested in this case are the minimum we can accept and still accomplish our mission.

THE CASE (1674) IN POINT *(small boxed area) is only one of the many military base (stars) airspace problems crowding the civil airway structure. Hatched areas are major restricted airspaces. (Adapted from LIFE map June 2. © 1958 TIME Inc.)*

"I call to your attention the fact that these areas are much smaller than the area previously used. We have compressed our activities into an area that may be more hazardous to the military; however, we must continue our training mission and also segregate such training from other segments of aviation. The Air Force is desirous of working out an agreement that will be compatible to the operation of civil users in this area."

General aviation representatives then took the floor.

Unanimously they concurred with the Air Force's need for segregated training areas. Fact upon fact, concerning general aviation's and the air carrier's operating requirements and capabilities in the areas under discussion, was entered into the minutes. Statement after statement was introduced giving details of general aviation's operations in the areas affected.

Again and again it was pointed out that (1) general aviation had not been represented on the CAA/Military team by a General Safety Office representative, but by a CAA Air Traffic Control representative whose knowledge was limited to air carrier operations; (2) the CAA had not developed the facts and figures concerning general aviation and had given their major efforts towards resolving the air carriers' requirements.

At the request of general aviation representatives, the meeting was recessed while the general aviation representatives present held an informal caucus.

Approximately twenty minutes later the meeting was called to order by Chairman Elliott.

General aviation—*in twenty minutes*—had come to an agreement; and it was an agreement which the air Transport Association and the Air Line Pilots Association fully supported!

The joint civil aviation position called for placing the floor of the training areas at 12,000 feet instead of 8,000 feet above sea level; for the retention of certain airways which would have been eliminated or dog-legged.

Further statements were made by the various military representatives concluding with an offer to "compromise" the floor question at 11,000 feet. After further examination of the general aviation position, the Air Force representative entered the following position on the record:

"The areas, as described, of the proposed Control/Restricted areas are the basic minimums necessary to accomplish the training required to produce qualified Air Force pilots. We will accept a 12,000-ft MSL floor within all of these areas except the area South of Webb AFB, even though we feel that it will require a restriction on training. Because of the lack of general aviation as well as other segments of the aviation industry transgressing the area south of Webb, we maintain the floor on this should not be greater than 10,000 feet.

"The acceptance of the 12,000-ft floor on the Restricted Areas around Webb and Reese and the 10,000-ft floor on the area south of Webb is in the interest of getting on with the basic problem; i.e., segregating flight activities that are not compatible with air traffic control procedures and other types of flying.

"We do reserve the right to reopen the subject at a later date in the event this 12,000-ft floor restriction makes it impossible to accomplish the training required to produce the quantity and quality of Air Force pilots required by the USAF.

"Acceptance of this restriction of a 12,000-ft floor in this area is not intended to be construed as being acceptable for other training command bases where the terrain and weather are different from this area. In accepting this restriction, we feel that the Air Force has more than compromised and that general aviation will not be affected to the degree that our training will be in the area."

It was obvious to the observers present that the Air Force had been misled by lack of information which the CAA member of the CAA/Military team should have developed in the preparation of the case prior to its submission to

the Regional Subcommittee in Fort Worth, Texas.

If the Air Force representatives had, the observers concluded, been given information regarding the numbers of general aviation aircraft, their routes of flight through the area, their normal operational altitudes, their frequency of flight—the Air Force would have been able to support the team proposal with knowledge, instead of ignorance.

Fort Worth Case 1674 was forwarded to Washington for consideration of the Air Space Division of the Air Coordinating Committee.

On October 21 the meeting was held.

Again the entire case was reviewed.

Again general aviation organizations presented their case.

In the meantime, NBAA had circulated a questionnaire to more than 700 business aircraft owners, operating single and multi-engined aircraft, in Texas, Oklahoma and New Mexico. They were asked to list the types of aircraft they flew, number of flights in the past 12 months in the area, number of operations anticipated in the next 12-month period; total operations and total hours flown per year; percentage of flights on airways, percentage of flights direct; percentage of IFR and VFR flights; airports in the area most frequently used and the altitudes normally flown on flights conducted in the area.

Working against time—NBAA was able to present to the Administrator documented case histories of business aircraft operations in and through the training areas requested by the Air Force.

These hundreds of case histories were further supplemented by facts and figures supplied to NBAA by 20 airport managers in the area and surrounding areas.

One of the principal questions asked was: How many business aircraft flights operated from your airport without filing VFR flight plans?

The answers revealed that a high percentage did not file flight plans, and that the resultant numbers of flight operations soared to astronomical proportions when viewed against the figures that CAA were using (contacts made with ATCS stations by VFR flights).

The case, at this writing, rests in the hands of the Civil Aeronautics Administrator.

Fort Worth Case 1674 has resulted in one concrete statement of fact by the CAA through their deputy Administrator of Air Space:

"The case was poorly handled. And as a result of the knowledge we have gained through this case we have now instructed our Regional Administrators to appoint General Safety Office representatives to the CAA/Military Teams. We have also invited industry representatives for the air carriers, the air line pilots association and from general aviation organizations to become members of the CAA/Military Teams."

This FTW 1674 represents one case involving two Air Force training bases with jet operations. There are 140 Air Force bases, 71 Navy bases and one Army base which are operating jet aircraft. There are 232 airports jointly used by the military with jet aircraft and by civilian aviation.

Each one of these 444 military jet-use airports represents a possible air space case.

Each one of these air space cases may require detailed analysis by all phases of aviation.

Business aviation—through its representative organization, NBAA—will be represented. How well they will be represented depends on the support NBAA receives from every business aircraft owner.

The case in point is yours to decide!

[Our purpose in running this CAA case "write-up" verbatim (below) is to familiarize the reader with the form and terminology of these case presentations. The author feels that it often requires expert analysis to bring out the significance buried in a mass of tiresome, statistical data.]

PROBLEM (Abridged)

Big Spring, Tex. (Webb AFB)—Lubbock, Tex. (Reese AFB)—proposed rescission, designation and/or redesignation of airways and the designation of "RESERVED" areas.

DISCUSSION

1. In accordance with the policies established by the Administrator of the CAA to provide segregated airspace for military training activities, airspace approval is requested for the following rescission, designation and/or redesignation of airways and designation of "reserved" areas. Certain items in this case affect areas which are under the jurisdiction of the Los Angeles Airspace Subcommittee, and have been forwarded to Region Four for consideration. An associated case to designate a standard 15° south alternate to VOR Civil Airway 68 between the Roswell, New Mexico VOR and the Hobbs, New Mexico VOR will be processed in the Los Angeles Subcommittee.

2. *Proposed Rescission of Federal Airways*—The CAA requests airspace approval for the rescission of the following airway segment

A. Red Civil Airway 68 between the Hobbs, New Mexico L/MF radio range and the intersection of the east course of the Hobbs, New Mexico L/MF radio range and the south course of the Lubbock, Texas L/MF radio range.

B. Red Civil Airway 69 between the Midland, Texas L/MF radio range and the Big Spring, Texas L/MF radio range.

C. Red Civil Airway 70 between the Midland, Texas L/MF radio range and the Lubbock, Texas L/MF radio range.

D. Red Civil Airway 71 between the Roswell, New Mexico L/MF radio range and the Lubbock, Texas L/MF radio range.

E. Blue Civil Airway 68 between the Midland, Texas L/MF radio range and the intersection of the northwest course of the Midland, Texas L/MF radio range and the east course of the Hobbs, New Mexico L/MF radio range.

F. Blue Civil Airway 30 between the Big Spring, Texas L/MF radio range and the Amarillo, Texas L/MF radio range.

G. VOR Civil Airway 14 north between the Dora VHF Intersection [Roswell, New Mexico VOR 063°T (051°M) radial and Lubbock, Texas VOR 278°T (267°M) radial] and the Lubbock, Texas VOR.

H. VOR Civil Airway 68 south between the Midland, Texas VOR and the San Angelo, Texas VOR.

3. *Proposed Designation of Federal Airway*—The CAA requests airspace approval for the designation of the following airway:

A. VOR Civil Airway 14 south between the Lubbock, Texas VOR and the Childress, Texas VOR via the Lubbock VOR 086°T (075°M) radial and the Childress VOR 229°T (218°M) radial.

4. *Proposed Redesignation of Federal Airways*—The CAA requests airspace approval for the redesignation of the following airways:

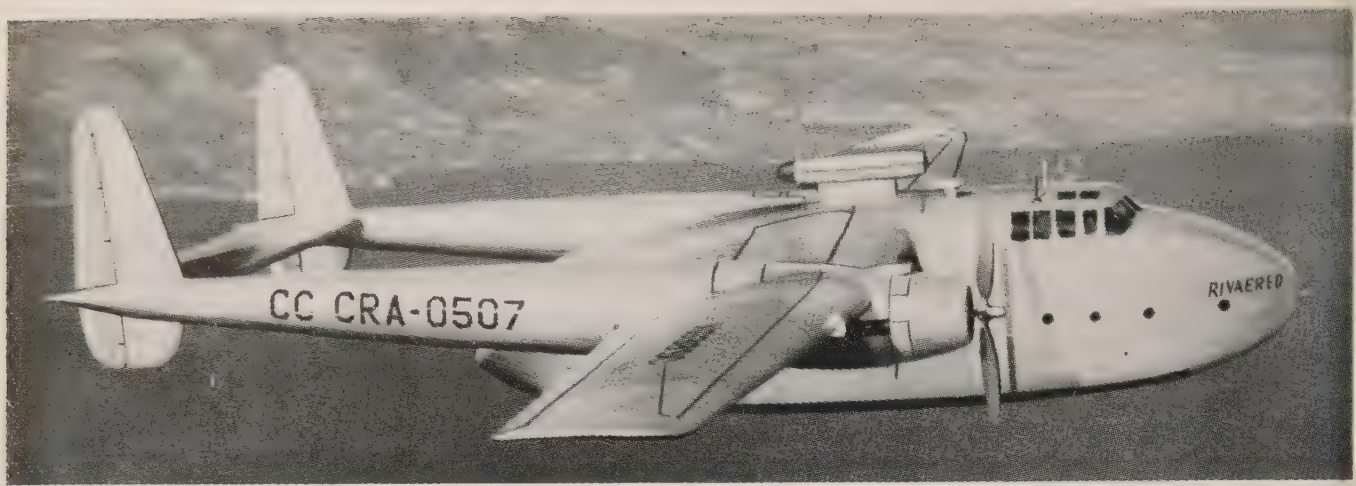
A. VOR Civil Airway 284 between the San Angelo, Texas VOR and the Fort Stockton, Texas VOR via the San Angelo VOR 238°T (227°M) radial and the Fort Stockton VOR 097°T (086°M) radial.

B. VOR Civil Airway 79 between the Hobbs, New Mexico VOR and the Lubbock, Texas VOR via the Hobbs VOR 077°T (066°M) radial and the Lubbock VOR 188°T (177°M) radial.

C. VOR Civil Airway 76 between the Big Spring, Texas VOR and the Lubbock, Texas VOR via the Big Spring VOR 286°T (275°M) radial and the Lubbock VOR 188°T (177°M) radial.

D. VOR Civil Airway 14 between the Roswell, New Mexico VOR and the Lubbock, Texas VOR via the Roswell VOR 080°T (068°M) radial and the Texico, Texas VOR 216°T (204°M)

(*Continued on page 58*)



A MEXICAN CORPORATION PLANE *(Steward-Davis Jet-Packet 1600) in flight over the Gulf of Lower California. Jet is used for high altitude (key Mexican airports) assisted takeoff, accelerated enroute cruise and pre-landing approach for "go-around" safety.*

Crossing The Rio Grande

by Emile Zubryn

Mexico has been much concerned with the unfavorable publicity it has received, as a result of "unfair treatment" of private and business aircraft at various Mexican airports, with bureaucrats making life miserable for incoming pilots. The "greediness" of certain functionaries, especially those at airports of entry, has been brought to the attention of the proper authorities and the Civil Aeronautics Bureau has promised that bribe taking, bullying and other "unethical behaviour" on the part of airport officials will not be tolerated.

The Bureau is aware that an important business and tourists current can enter Mexico by way of privately owned aircraft. It is being stressed that they will hereafter receive courteous and fair treatment without any undue red tape or delays.

Airport employees and certain other officials have been having a heyday, charging for whatever small service was given. Landing fees in excess of official fees were exacted as well as other demands which so outraged many American pilots that they decided to return to the U. S. and not continue into Mexico.

The Mexican government, in the first boost since 1949, has slightly upped landing fees at municipal, state and federal facilities. The smaller planes in the 1-2000 lbs category are now assessed $.56 at Class 1, 2 and 3 fields. For Class 4, the fee is $.80 and for Class 5 and 6 (the latter being for Central Airport) $.96. Rates for non-commercial planes will be higher for heavier aircraft, with scales ranging from $.56 to $27.60 for planes in excess of 150,000 lbs. Commercial planes pay a higher rate, ranging from $1.20 up proportionately double.

Planes making emergency landings are exempt from all fees, as well as aircraft undergoing test, used in rescue operations or flight training. When, because of mechanical failure or inclement weather, a plane is obliged to return to the airport of departure, it is exempted, provided it did not land somewhere else first.

These rates include parking facilities for 24 hours. After this, there is an additional 20% for each day or part of a day. There are other charges, however, for use of runway and airport lights, radio communications, weather services, etc.

The Civil Aeronautics Bureau has announced that it is rapidly increasing field facilities from the rudimentary class 1 (usually a level grass field). Plan is to make improvements to airport status of such facilities in Baja California, Durango, Vera Cruz, etc. Also modernization in the deep south —in Chiapas, Campeche, Tabasco and Yucatan.

The Bureau is making clear the fact that U. S. registry aircraft need not fear that they will have to pay duties. Things had gotten so out of hand that an airport official in Matamoros attempted to enforce a payment of duty on a private plane flown by Hector Mariscal. He picked the wrong "fish" because Mariscal represented a U. S. aircraft manufacturer and is a Mexican. The erring official had mistaken him for a "gringo!"

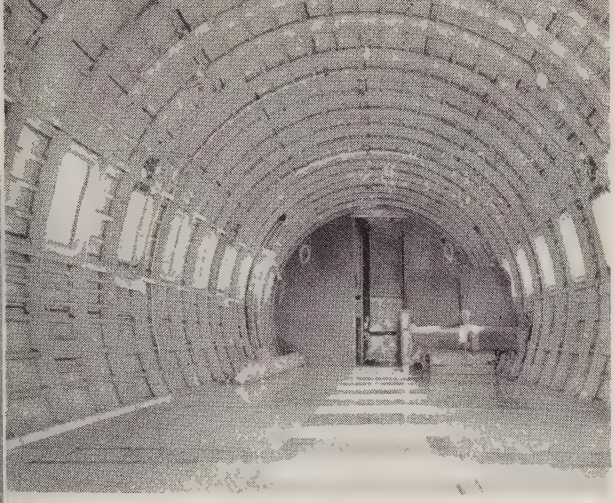
Still, in order to obtain clearance, Mariscal had to phone the Bureau in Mexico City. He finally was allowed to leave with the frightened official at the field claiming he was unfamiliar with Article 165 of the Customs Code which stipulates that new planes entering Mexico under their own power are exempt from duties. There is no knowledge of how many U. S. aircraft may have been turned back discouraged because of what seemed to be a shakedown effort.

Another major point that has been cleared up is that a pilot on personal business need no longer guarantee the return of his plane, as is the case with automobiles. There were cases where a pilot has damaged or wrecked his plane and then been hounded by border authorities because he was leaving the country by other means than the plane with which he entered.

If U. S. personal or business plane pilots should be subjected to any form of extortion, they should communicate directly with the Bureau in Mexico City. Usually, the threat to do this, directed at local field officials, will clear the way for them.

The Aero Club of Mexico will also undertake a publicity drive to counteract these bad practices of the past which have seriously curtailed this beneficial air traffic into Mexico. No statistics exist, but it is estimated that a majority of aircraft that originally plan flight into Mexico never reach the capital city, for just such reasons.

It is safe to say that, with federal authorities stepping into the picture to insure better treatment and hospitality for southbound flights across the Rio Grande, that U. S. and Canadian pilots will find things much changed for the better.



Complete Service to Corporate Operators

BEFORE: *A Convair 440 as delivered by the factory to PAC.*

On the occasion of the company's 30th anniversary of service to the aircraft industry, Pacific Airmotive Corporation's Burbank Aircraft Division was too busy to even take time out to celebrate. Superior Oil Company's factory-new Convair 440 had arrived from San Diego and work was already under way on the modification of the aircraft's operating systems to the customer's specifications. Installation of a deluxe cabin interior was progressing simultaneously with the other work on the plane.

A short distance away, a Convair 240 was undergoing modification to accommodate the installation of special electronics test equipment. The Laboratory of Electronics, Inc., Boston, Mass., flew this plane into Burbank so that the work could be done by PAC's skilled aircraft mechanics.

Inside one of the hangars, the new PAC-PacAero modernization and speed-up kits were being installed on three Beechcraft D-18s. As a result of the powerplant, gear door, twin heater and stabilizer modifications, substantial performance improvements have been made on Twin Beeches owned by LeSage Industries, Dallas; Max Pray, Chicago; and Pacific Lumber Company, San Francisco.

Most any time during the past year, two or more Convair 340s or 440s were being converted for corporate customers at PAC's Burbank Aircraft Division, conveniently located just off runway one-five at Lockheed Air Terminal. Most of these aircraft had been purchased new from Convair in airline configuration. PAC's basic assignment was to convert these aircraft, which had been designed to transport 44 people for short distances, into business airplanes that would be carrying executives comfortably for long distances.

Transcontinental capability was given to these Convairs by expanding the integral wing fuel tanks to increase fuel capacity to 2080 gallons. Engine oil tanks were expanded correspondingly. The existing cabin oxygen system was relocated and expanded.

Special floor and under-floor structure was provided to accommodate V.I.P. swivel chairs, divans, custom cabinets and other furniture.

Convair-installed airline radio configuration was completely removed and replaced by custom redesigned and re-engineered radio installations, including all new junction boxes, relays and wiring. Some of the radio equipment arriving with the airplane was incorporated into the new installation, although much was eliminated and replaced with specialized units more adaptable for corporate use.

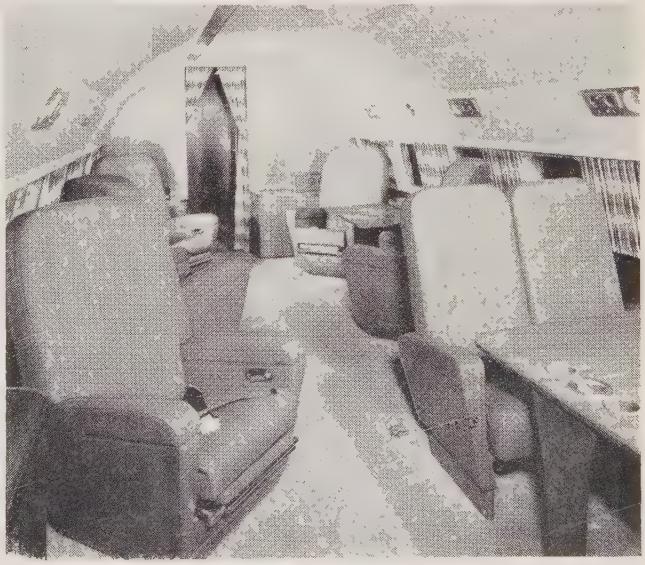
Interior modifications included removal of the airline interior, including soundproofing, and substitution of new and improved lightweight soundproofing. Airline-type hat racks and handrails were eliminated and cabin air ducting was flush-mounted in the cabin ceiling. Custom-built furniture, fixtures, chairs and divans were installed, with colors carefully selected to harmonize with deluxe new fabric or vinyl headlining, side panels and wainscot. Special carpets and carpet padding were also provided. Dual lavatories with hot and cold water were installed and custom galley, coffee and beverage bar equipment was furnished.

An airborne auxiliary power unit was installed in the aft baggage compartment, enabling the aircraft to be completely independent of outside electrical sources. This unit is enclosed in a stainless steel box, is controlled from the cockpit, and has its own separate fire detection and fire prevention equipment.

Automatic engine spark advance and engine analyzer equipment was installed and the aircraft's electrical system was augmented to provide for special equipment in the cabin galley and lavatories. Such items as cabin temperature controls, windshield defroster controls, and propeller feathering switches were relocated, and auxiliary air compressors and ADI tanks were installed.

As a result of the many modifications made by PAC-Burbank, these Convairs become a fast, comfortable and flexible business tool, independent of support equipment at outlying destinations.

Some of the many other companies who brought their aircraft to PAC-Burbank for major modification work during the past year were Morrison-Knudsen, Anchorage, Alaska; Gulf Oil Corp., Pittsburgh; Bethlehem Steel, Bethlehem, Pa.; Imperial Oil Ltd., Toronto, Canada; Richfield Oil Co., Los Angeles; Sears Roebuck, Los Angeles; Allegheny-Ludlum, Pittsburgh; Belridge Oil Co., Los Angeles; Mellon National Bank, Pittsburgh; Growers Ice and Development Co., Salinas; Fred J. Early Co., San Francisco, and Catalina Air Transport, Los Angeles.



AFTER: *Handsomely appointed custom interior by PAC craftsmen.*

TWO "IRON LUNGS" *installed in Douglas DC-3 "flying hospital" for use in South America.*

"FLYING HOSPITAL"

Licks Remote Area Problem

by Don Downie

The role of the airplane in opening up remote areas and access to natural resources has created corollary problems associated with company or government personnel set down in these spots remote from adequate medical and hospital services. Temporary, and usually inadequate, "portable" dispensaries can meet minor and first-aid situations only. At the same time, many such spots do not justify more complete and expensive installations. Aviation is providing the answer—complete air-transportable medical and surgical facilities quickly and successively available on call or schedule.

A flying hospital, designed primarily for respiratory diseases, is now in operation in Argentina. The converted DC-3 carries two "iron lungs" and complete operating facilities.

The new mercy plane is to be operated by the Public Health Service of Argentina, flown by Navy crews, and will be able to handle emergency cases enroute to hospitals. Development of this flying hospital followed a series of polio epidemics in Argentina two years ago. The Health Service wanted a plane big enough to carry several litter cases, the "iron lungs," doctors and other hospital-type equipment and still be suitable for small field operation.

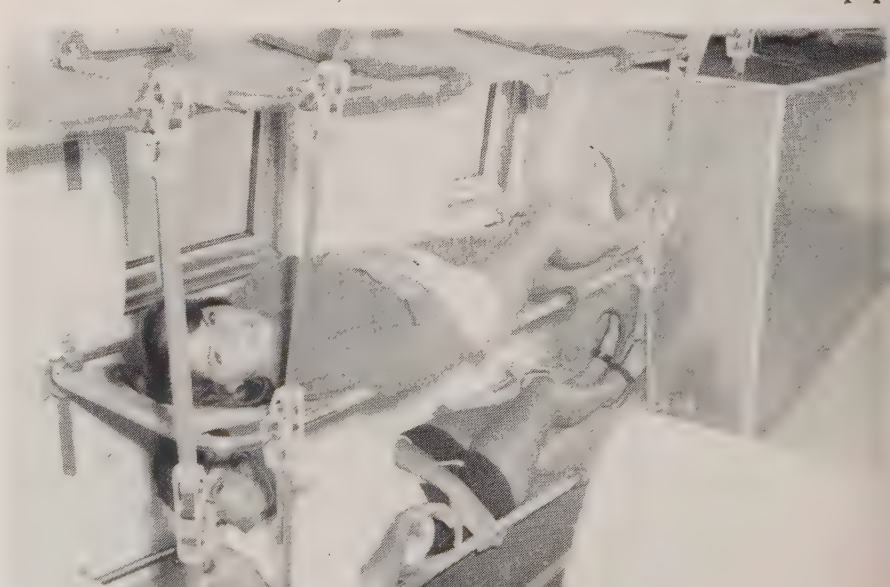
The converted C-47 has a complete surgery table and two Monaghan portable lungs. Other medical equipment includes two rotary pumps, four resuscitators, two portable respirators, two 12- and two 24-volt portable batteries, eight litters and an auxiliary power unit. The complete medical equipment totals 1600 lbs. By some small community standards it is capable of handling a virtual "catastrophe" situation.

Calair International, a Santa Monica, Calif., aircraft export company, sold and supervised the outfitting of the plane. Interior design and installation of the medical equipment, with an 8,000-hour overhaul on the airframe, was completed by Volitan Aviation of Pacoima, Calif. General Logistics division of Aeroquip Corp., Pasadena, Calif., supplied the cabin tracks, fittings, litter bracket assemblies and Weblock tension-locking Strap Assemblies to hold down the operating table.

OPERATING ROOM *occupies forward part of DC-3. Note provisions for both walking and litter patients plus flying hospital "staff." Iron lung is near cargo-hatch door.*

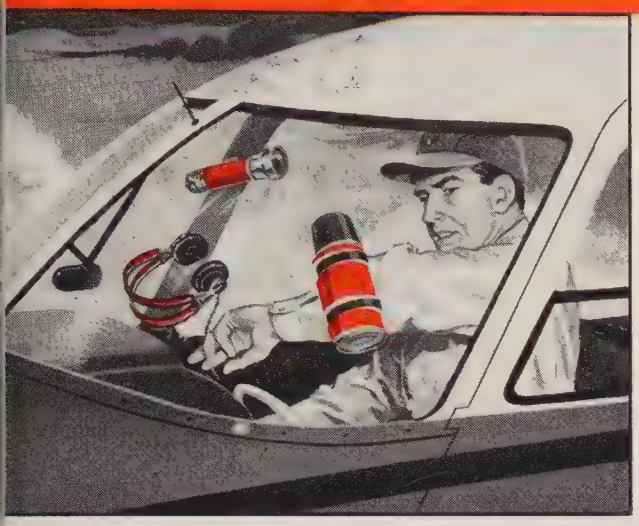
Quick attachment and removal capability was a must. Track fittings are inserted in the track, slightly turned and instantly locked. Seats with the track fittings quickly lift out and are attached to a track in the wall, or can be moved up or down on the track. The stretchers, with General Logistic's litter bracket assemblies, quickly attach and remove to vary passenger capacity.

An interesting note is that the fuselage of this airplane, which is now working to save lives, was last used for advertising purposes atop a restaurant in Johannesburg, South Africa!



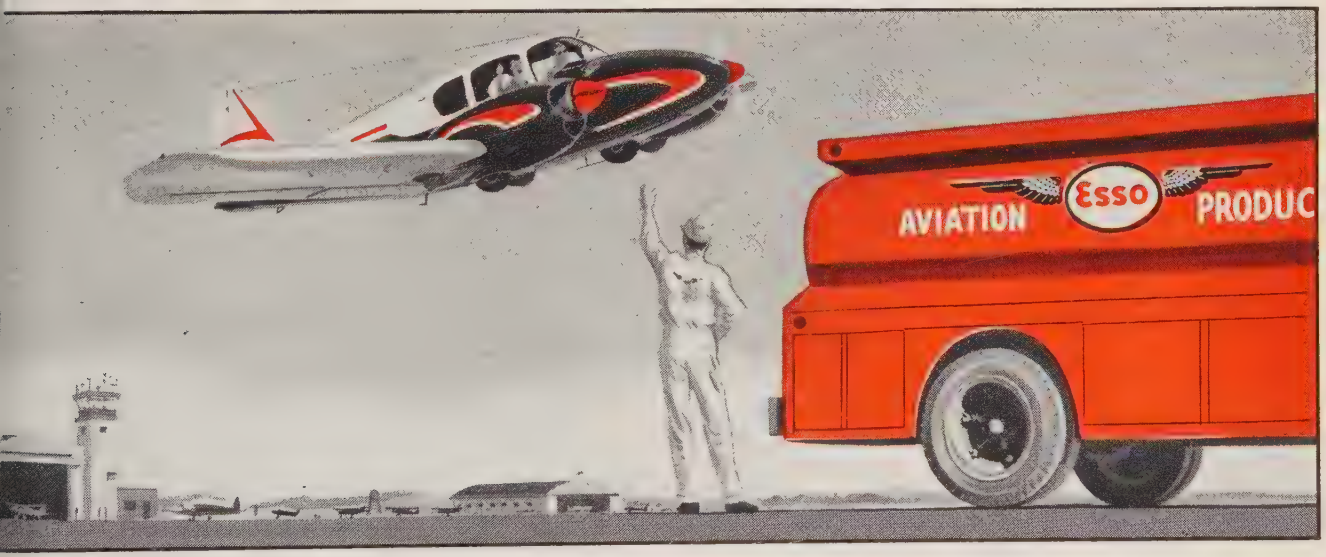
EIGHT LITTER PATIENTS *can be carried in Argentine Public Health Service Douglas DC-3*

WING TIPS



-FLIGHT BOMBARDMENT. Before take-off, be sure to eck cabin interior for loose articles such as earphones, shlights, thermos jug, etc. Should gusty air conditions ake the flight rough . . . these innocent looking objects can come flying missiles.

TAIL HEAVY. Ever try to take off with a couple of bags of cement on your tail? Well rain can cause you the same kind of trouble when it seeps in and collects at the tail-end of your fuselage. Wing Tip: when the weather's wet, check the fuselage inspection holes for signs of water and ice.



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SEND IN YOUR TIPS! Every pilot has his own special set of safety tips, and undoubtedly you have some that would be of interest to other pilots. Why not write up a couple — in about the length of the ones on this page—and mail them to: Esso Wing Tips, Room **3120,** Esso Standard Oil Company, 15 West 51st Street, New York 19, N. Y. Any tip will be warmly appreciated. And if published . . . you'll get full credit in the ad.

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Circle No. 10 on Reader Service Card

FLIGHT PATH COMPUTER

by Joseph Bush

This instrument, styled the Flite Path Computer, relates the Gyro Horizon attitude to positive aircraft performance under both normal and emergency operating conditions.

Authoritative sources have termed this interesting device as "a significant advance in instrument flight technique, accurate to a gnat's eyebrow." This instrument has a wide operational and training application to our present business aircraft and the Flite Path Computer will prove to be an invaluable aid in the transition to and the operation of the turboprop and turbojet business aircraft of the immediate future.

The concept embodied in the Flight Path Computer is amazingly simple and effective. The airplane pilot is provided with a pre-computed attitude pictorial presentation in relation to the Gyro Horizon with corresponding power required for a desired performance in any flight segment. And the computer properly relates all factors of thrust, lift and velocity to attitude plus thrust horsepower. The professional pilot flies his airplane more or less by instrument reference all of the time regardless of the weather condition. The pilot does this for two very basic reasons:

1. Attitude is safe and effective under all conditions.
2. He can control the airplane with more precision by instrument reference, than can be done by visual reference to the natural horizon.

Practically the only exception is the flare out for landing. Some day in the not too distant future, pilots, both civil and military, will be taught the instrument concept from the very beginning as a foundation for more accurate and safer aircraft control. Transport Flight Systems, Ltd., is presently engaged in some interesting research on the area of primary and basic instrument flight training, utilizing the Flite Path Computer.

Several thousand hours of successful operational experience with the Flite Path Computer has already obtained in a wide variety of business aircraft. This instrument is presently being flown by: Capt. A. L. Ueltschi, Pan American World Airways, Inc. and President Flight Safety, Inc., Douglas B-23, Captain Carl C. Cass, Gulf Oil Corporation, Lodestar, Houston, Texas, Captain Claude Northrup, Gulf Oil Corporation, Beechcraft D-18's, Houston, Texas, Captain Steve Germick, The Texas Co., Douglas DC-3, Houston, Texas, Captain Stein Lee, Gulf Oil Corporation, Lodestar, Fort Worth, Texas, Captain Robert Harlow, Transcontinental Gas Pipeline, Lockheed, PV-1, Houston, Texas, Captain Donald Keeley, Chief Pilot National Cash Register, Douglas DC- Dayton, Ohio, Captain Carl Lund, Chief Pilot, Internatic Paper Co., Beechcraft D-18's, Mobile, Alabama, to n only a few. In addition the Flite Path Computer is insta in the Flight Safety, Inc. Convair Translator situated at Marine Terminal, La Guardia Airport, New York, N. where the instrument is being utilized as a flight training device to relate T-Catagory aircraft performance to attitu

The Flite Path Computer is mounted and attached alo side the Gyro Horizon. The basic principle of the Comp is a precision manufactured, manually operated device, w utilizes a pointer reference marker 1/16 in. wide and exten across the face of the Gyro Horizon 3/4 of the length o horizon bar. The pointer reference marker may be move and down by rotating its adjustment knob. The mover of this pointer reference marker is scaled to a fixed vi scale on the Computer of 1/32 in. increments, with an indi indicating pointer reference movement on the scale. In dition are two indicies which may be locked into position future reference. The lower indicies may be locked int pre-computed climb position for takeoff and the upper dicies may be locked into a pre-computed descend posit In this manner a proper attitude reference for either tak or approach is always available for constant use and refere by the pilot.

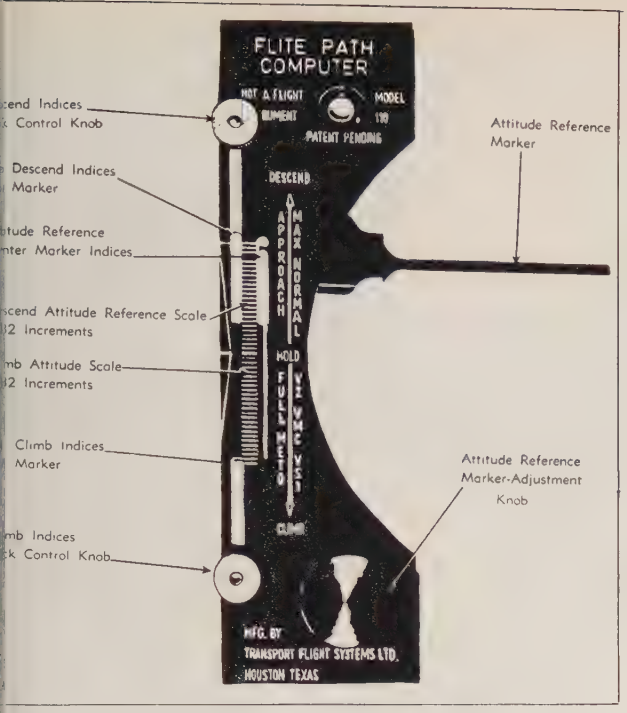
Engine Out Condition at Minimum Take Off Safety Speed

There is no flight condition where attitude, speed and rectional control is so critical as during an engine out dition on takeoff in multi-engine airplanes because of important facts:

1. Aircraft design and performance limitation impo upon the pilot.
2. The element of surprise, in the event of engine fai on takeoff, which element, training and practice never for obvious reasons entirely alleviate.

Here is a condition where the Flite Path Computer car of invaluable assistance. This Computer may be set utilized for a variety of maneuvers and performances, t are for: cruise all engines, engine out enroute, all en and engine out approach and descend. These features actually a bonus. The effective and most important thing Computer does is, in the event of engine failure at or a V_2 on the runway:

1. Will provide positive directional control informat
2. Will provide positive speed control at and not below



. Best angle of climb available to clear immediate obstructions and keep the airplane within visibility limits for circling approach.

. On engine out overshoot, assurance of positive and safe go around procedure.

e Flite Path Computer will not give the airplane any additional power or lift. But, it will measure everything positively t the airplane has in performance value, and reduce the ot work load in the most critical phases of flight.

ting the Computer for Critical Engine Out on Take-Off

The Computer is pre-set for the V_2 climb attitude by the owing simple flight test:

The Flite Path Computer is pre-set for the all engine opting V_2 climb attitude, by climbing the airplane with gear and flaps up with all engines at manufacturer's recomnded climb power at the lowest practical altitude. The nb speed should be at either 30 knots or 35 mph above specified V_2 speed of the subject airplane. With the airne steadily climbing under the foregoing specified condis, the adjustment knob for the pointer reference marker rotated until the marker is exactly on and parallel to the izon bar of the Gyro Horizon. The bottom climb indicies moved into alignment with the pointer reference marker icies, and then locked into position by rotating the locking ob clockwise. The climb indicies is now in position for all ure takeoff's.

After this procedure each take off is made with the pointer erence marker indicies in exact alignment with the pre-set mb indicies. Upon reaching runway lift off speed of V_2 h full power applied to all engines, smoothly change the itude holding the Gyro Horizon bar exactly on and parallel the pointer reference marker of the Computer. Retract gear and should an engine out condition occur at this nt, hold the Horizon bar exactly on and parallel to the erence pointer of the Computer and either feather the perative engine or reduce it to zero thrust with prop con full back. Power may be reduced to Meto on the operating gine (s).

As long as the Horizon bar and the properly set reference nter of the Computer are held in exact alignment, the airne will not turn but continue in the best available angle climb straight ahead to a safe maneuvering altitude to urn to the airport.

In demonstrating the capability of the Flite Path Computer engine failure at takeoff, Mr. Burger has made the following demonstration many times. After pre-setting the computer for the subject airplane, he placed the pilot under an instrument hood prior to takeoff, also masked the airspeed indicator, rate of climb and the RMI or other heading information. As the pilot began the takeoff, V_2 was called out to the pilot who changed the attitude to the climb position indicated by the Flite Path Computer and retracted the gear. With the gear starting the retract sequence the critical engine was reduced to zero thrust, and the airplane was flown by the pilot to published circling limits by sole reference to the computed attitude with power reduced to Meto on the operating engine. The results in every instance were that the airspeed did not fall below V_2 and the heading did not change more than three degrees with a positive climb angle to clear all obstructions to published circling limits.

Pilots who have been given this demonstration have without exception stated that an engine failure experienced utilizing the Flite Path Computer was both comforting and assuring and that they could not be without the distinct safety advantages that the instrument afforded.

How Accurate Is the Gyro Horizon?

One question that is asked frequently is how accurate is the Gyro Horizon and what effect does acceleration have on the Gyro. In the early development of the Flite Path Computer the possibility of so-called Gyro acceleration error became a paramount consideration. In order to determine the existence of this problem, if any, it was necessary to accelerate under controlled laboratory conditions all models of Gyro horizons in use today to determine these errors on a factual basis. As a result of these tests it was determined that the modern gyro-horizons with which business aircraft are equipped, provide no cause for alarm, for the following reasons—all confirmed by Sperry Gyroscope Company:

1. The direction of "vertical," as sensed in the erection device, is altered by acceleration. However, the Gyro-Horizon will not precess or change its position at a rate greater than its erection rate.
2. In the case of the H-6B Gyro Horizon for example, the erection rate is two (2) degrees per minute. Assuming an acceleration period of thirty seconds (most airplanes are off the ground in twenty seconds), the total horizon bar displacement would be one (1) degree which corresponds to one-half (½) the width of the horizon bar. This diminishes as the erection device reaches its maximum rate and the gyro precesses to the new position.
3. Any attitude indicator will sense and *start* to erect to a false sense of vertical during takeoff acceleration. The maximum error generated is the product of the erection rate of the Gyro and the duration of the acceleration. The error is generally independent of the rate of acceleration. Instruments having low erection rates will give minimum errors.
4. That all errors sensed by the Gyro that is normally functioning are constant errors and may therefore be computed accurately. Which in the case of the Flite Path Computer being set for a pre-computed attitude will result in the same desired performance in the same flight segment all of the time.

In addition it was determined that 1/32 in. of attitude change affects average aircraft performance to the extent of at least 7 mph and 250 fpm climb, and that 1/32 in. of attitude change cannot distinguished with the unaided eye due to introduced parallax. Only a precision manufactured device such as the Flite Path Computer will ever successfully accomplish and solve the relation of attitude to T-Catagory performance which this instrument calibrates and measures to a degree not heretofore attainable.

Fremont W. Burger, operations manager of Flight Safety, Inc. Houston, Texas, developed the instrument and organized Transport Flight Systems, Ltd. to market it.

Reader Service Card No. 69

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Circle No. 11 on Reader Service Card

The Weather Bureau's Five-Year Plan

WTON A. LIEURANCE, *Director, ation Weather Services, U.S.W.B.*

Caught in the vise between reduced appropriations and the demand for re services and more accurate serv-s, the Weather Bureau has neverthe-s come up with a 5-year plan to vide more personnel, better dissem-tion, and greater accuracy for all ather aviation service.

Newton A. Lieurance, Director, Avia-n Weather Services, U.S.W.B., ted in a talk before the NBAA 11th nual Meeting & Forum in Philadel-a, that "a truly modern aviation ather system capable of meeting cur-t and anticipated needs can be ieved only through the application technological developments, involv-mechanized components to arrive at *semi*-automatic operations both in observing and forecasting."

"Some features of the planned system are either already being introduced or can be implemented without further major research and development. These are the continuous, frequently revised broadcast, remote TV briefings, improvements in the self-help WB office displays, automatic telephone-answering weather briefing systems and a general improvement in the type of information disseminated."

"Today the gap between the weather service needs of air operations and that which can be provided borders on a critical limit," Lieurance said. "During the next few years, the growing aviation industry will create still greater demands to be met. This is recognized by the Weather Bureau, the Department of Commerce and others in government concerned with aviation."

Mr. Lieurance went on to say that the Weather Bureau still considers airport weather services "the most important part of our services" and much effort is being applied to improve the factual reporting of approach ceiling and visibility conditions to more accurately reflect what the pilot will see when he breaks out! Rotating beam ceilometers as well as Runway Visual Range measurements are an integral part of this program.

A good response has been had from the fairly new Flash Advisory service, warning of severe weather conditions, in which respect, the use of radar has been the most valuable aid. It is hoped that new equipment will soon replace World War II upper air sounding equipment, providing better forecast foundations.

Remarking on their concern at the reduction of hours of coverage at a "number of stations," Lieurance said that, "every effort is being made to establish Weather Bureau stations at higher activity airports on a priority basis similar to that used for the establishment of air traffic control towers . . . and to expand operations at existing offices . . . particularly where we have been forced to reduce coverage from something less than 24 hours."

In the area of better briefing coverage, the hoped-for funds for expansion of personnel to cope with this most vexing problem will be a key factor in restoring 24-hour service to the flying public. END

eneral News

Outstanding Service By lustry

Undoubtedly the greatest support for the se of our neglected aviation weather ices has come from business aviation. a move that is so outstanding that it its special mention is the reported in-nation that the Storm Detection Radar rently in use at Akron-Canton Airport he gift of Timken Roller Bearing Co. a Decca Type 41, purchased in England, as a normal range of 0-150 miles and a ximum available of 280 miles. Output ies from 100 to 30,000 watts and vital ther information obtained therefrom is ilable to all the public. Timken, an AA member, is also the first user of a lian, American-assembled jet for busi-s purposes.

Wind SSE 20 + 40"

om Cab files

After a routine flight from the mid-st to Westchester County Airport, w York, a Radio Corporation of erica DC-3 reported over the Outer rker on a straight-in ILS approach runway 16. Westchester weather was ng reported as "Ceiling measured 00 feet overcast, visibility 4 miles, n shower, wind SSE 20, peak gusts 40, altimeter 29.73." The crew ack-wledged receipt.

After breaking contact at about 1800 to 1700 ft msl, approach was continued with the field in sight. Moderate gusts were encountered on the approach. During the flare-out for touchdown, a gust was encountered which threw the DC-3 into a nose-high, left-wing low attitude. Takeoff power was applied, gear retraction was started and attempt made to level the wings. The DC-3's left wingtip and left landing gear contacted the runway with sufficient force to break the outer brake flange on the wheel.

The wingtip scraped along the runway for approximately 55 feet, then swerved towards the east and off the runway into the grass area. At this point, the wings finally leveled and the DC-3 became airborne again on an easterly heading.

Continuing flight in a nose-high but nearly level attitude, the DC-3 passed over a hangar before contacting the ground again in the vicinity of a highway bordering the field. At the time, full power was being developed, the gear was retracted, flaps extended 2½ inches and landing lights were on.

The aircraft slid 126 feet, struck a stone fence on one side of the road, slid across and struck the fence on the other side.

Pilot and copilot suffered minor injuries. The four passengers, who had been seated in the rear of the cabin in swivel seats facing rearward were uninjured, although the DC-3 suffered major damage.

CAA Issues Maintenance Guide For Owners of Electronic Equipment

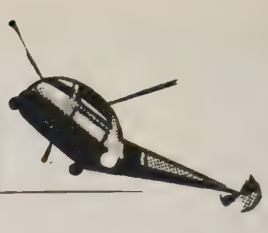
WASHINGTON—Owners of aircraft are cautioned in a Civil Aeronautics Administration publication, "Flight Operations and Airworthiness Release No. 424," that the cost of indifferent maintenance of aircraft radios and electronic equipment can be measured in lives.

Information is presented in a series of questions and answers on radio communication and navigation sets, radar, automatic pilots and components of these flight aids. Under instrument flying conditions lives of aircrews and passengers may depend upon proper functioning of electronic equipment.

Stressing safety, the new publication points out that only persons authorized by Civil Air Regulations may work on aircraft radios. Requirements for an approved Radio Repair Station rating are given. Further information on this rating is available from any of CAA's 90 General Safety District Offices or the Washington Office.

Copies of "Flight Operations and Airworthiness Release No. 424" may be obtained by writing to the Civil Aeronautics Admin., Wash., D. C.

Helicopters for Business



Metal Rotor Blades Available for 1959 Model 47J Bell Ranger

Designed and manufactured by the Bell Helicopter Corp., metal rotor blades are an optional feature for the '59 Ranger.

The blades are the same length as the standard wooden blades. The metal blades are certificated for 2,500 hours use and have CAA approval for use at gross weight up to 2,850 lbs on the 47J.

Fred Roscoe, Commercial Domestic Sales Manager, points out that there is less vibration with the metal blades and that because of higher inertia, autorotational capability is increased. Once trimmed and balanced the blades require no further attention, and they are unaffected by weather.

The new four-place is equipped with blue tinted plexiglas for improved visibility. It cuts daytime haze and night-time glare by 50% as well as reduces cabin temperature by 10 degrees.

Helicopter Service for Western N.Y.

Helicopter Services of Buffalo is the first commercial helicopter operation to be established in western New York.

Based at the Buffalo Airport, the new service will provide lease and charter services. The company has one Bell G-2 Trooper and one Bell 47-J.

Managing the new company are three partners: H. Leibee Wheeler, president of Buffalo Aeronautical Corp.; Donald A. Heussler, commercial pilot and insurance executive; and Jack B. Prior, executive pilot. Helicopter Services was inaugurated in October.

Kaman Named Licensee for Fairey Aviation Co.'s Rotodyne

Kaman Aircraft Corp., Bloomfield, Conn., and The Fairey Aviation Co., Ltd., Hayes, England, have complet a license agreement for Kaman to ma ufacture the world's first vertical tal off turboprop aircraft in the U.S.

The craft has made more than 1 flights since its maiden flight in Nove ber 1957. On April 10 of this year, t Rotodyne made its first transition fr vertical to horizontal flight. This w accomplished in straight, level a steady flight without any loss in a tude. The two turboprops alone we used without rotor power. (See SK WAYS, page 48, November 1958.

Omega Progresses Towards CAA Certification for the BS-12

The experimental BS-12 helicopter of Omega Aircraft Corp. is making steady progress towards certification, company officials report.

The craft now features twin powerplants, Franklin 225 hp, equipped with Ai Research turbo superchargers.

These engines are to be replaced soon with Lycoming 265 hp powerplants. Still later, says a company spokesman, the Lycoming 305 hp engines will be used.

CAA certification is expected soon after the first of the year.

Omega president and designer of the BS-12, Bernard W. Sznycer, describes his objective for the helicopter as a "truly commercial economical aerial workhorse that can perform a wide range of essential communication and haulage tasks whether the need is quick transport of company personnel. . .vital cargo. . .or other transport" requiring a versatile machine.

Fuel consumption of the two Franklin engines is only 26 gph. This is significant for operations in remote areas where fuel must be shipped in.

Single engine landing rate of descent is 125 fps at 4,300 lbs gross weight. "Full autorotation landings are, of course, not as easy as single engine but do not require any unusual skill," says Sznycer.

A single engine takeoff has been made successfully with a gross weight of 4,050 lbs and air temperature of 70. Holding 34 in. MP, the pilot, Robert L. Nields, flew the craft in ground effect. He believed that if he had held 36 in. MP he could have flown out of ground effect and circled the field.

The BS-12 has a four-passenger, plus pilot and 160 lbs of baggage capacity. This is an equivalent load of about one-half ton. External cargo loads are carried between the cabin and the rear landing gear.

Turbine Engines Offer Helicopters Operations Economy, AIA Official

A major "break-through" in econo of helicopter operations is offered turbine power plants, says L. We Pogue, counsel for the Aircraft Ind tries Assn.'s Helicopter Council.

"It appears that the turbine-powe transport helicopter of the future w have a direct seat-mile operating c of not more than 10 cents," he sa "compared to the approximately cents per seat-mile direct operati cost of reciprocating engine transp helicopters now in use, the largest c rying 12-15 passengers."

Pointing out that one of the ma current impediments to air travel is time it takes to move between do town and the airport, Pogue belie that jets and helicopters as partn would solve a "significant part" of t problem.

He cites that ground time betw LaGuardia Airport (New York), instance, and downtown is 50 minu compared with 9 minutes by helicop

Pogue warns that airport manag must pay careful attention to state municipal laws and ordinances t could deny the helicopter adequate erating authority. ". . . begin now get action for early future expans of helicopter service," he told Southeastern Airport Managers As at Palm Beach, Fla.

Increased Copter Use Seen in Near Future by Air Traffic Experts

The next ten years will see a t mendous growth of helicopter ope tions, reports Planes, Aircraft Ind tries Assn. publication.

Some 30,000,000 annual takeoffs landings by civil helicopters are a cipated by 1965, according to air t fic experts. For comparison, there w about 25,000,000 takeoffs and landi by fixed-wing craft, both civilian military, during 1957 at airports ser by CAA control towers.

By 1965, helicopter air carrier op ations alone are forecast to be mak 10,000,000 takeoffs and landings.

npany Officials Ferry New ıter from Texas to California

ice presidents of National Helicop- Service and Engineering Co., R. T. ɔreath (left) and Robert Watson, the firm's new Bell 47J Ranger n the Fort Worth, Tex., plant to r home base at Van Nuys, Calif. mmediate assignment was with the ifornia Institute of Technology. The copter provides quick transporta- for personnel and research data

ween Cal Tech's campus headquar- and area research installations. Besides turning out outstanding en- eering graduates, the school oper- s for the Army the Jet Propulsion development center. School also igned and built instrumentation for ny's Explorer earth satellite. The Tech contract runs for one year possibly includes the use of the icopter at Cape Canaveral, Fla.

tered Helicopter Taxi Service

HeliCabs" will provide metered icopter taxi service in the St. Louis a. Inaugurated by Remmert-Werner ., Lambert Field, St. Louis, Mo., the taxis are available on either a trip contract basis. Purpose of the "Heli- ɔs" is to provide time savings esti- ted by the company at 50% to 90% r ground traffic.

The helicopters will be radio dis- ched and will feature meters with ıch cards which the passenger may ɔp as a combination receipt-invoice. Proposed in an area-wide cooperative ɔgram are public heliports at stra- ic points throughout the metropolitan trict, to be established by various ic groups; private landing spots at ustry sites and rooftop landings on Chase and Park Plaza hotels as ll as the downtown Mart Building. Similar HeliCab services are planned installation later at Toledo, O., and mpano Beach, Fla., where Remmert- ɛrner has other aviation operations.

ctric Power Replaces Piston gine in Radio-Controlled Copter

Kaman Aircraft Corp. has announced electrically powered version of their io-controlled, pilotless helicopter.

The piston engine in the helicopter replaced with a lightweight high- tage AC electric motor which gets its power through a cable from a 250 KW gas turbine driven ground generator.

Among advantages of such an aircraft is the fact that it is possible to keep it airborne over one location for long periods of time. The system is designed to operate completely automatically and maintain a station at given altitudes above the base equipment.

Use of electric power provides inherent rotor speed governing and simplifies mechanical and electrical installations.

Kolibrie At Work in Former Zuiderzee Area Reclaiming Land

One of the first Kolibire ramjet helicopters to be sold went to the Wieringermeer Directorate, an official Dutch body which is in charge of the new Yssel-lake (former Zuiderzee) polders. The aircraft, the PH-YMP, was used to destroy coltsfoot, a weed which endangered the newly won soil, and to sow reeds in the recently formed polder (low land reclaimed from the sea) Easter Flevoland.

During two months of operations, pilot Robert A. S. deBlécourt flew a minimum of 120 hours. Daily flying

average was 3 to 4 hours with a high of 9 hours.

In the weed-killing operations, 3,000 acres were sprayed in 40 hours with the Kolibrie's special 50-ft wide spraying gear with a swath of 70 ft.

A total of 40,000 acres of polderland was sowed with reed in 80 flying hours. Reed improves the initial quality of the former sea-bottom. Later it can be made to disappear by lowering the ground water level.

Bell HU-1 Headed for Civilian Use

The turbine-powered Army HU-1 helicopter is being readied for certification for civilian use, Bell Helicopter Corp., Fort Worth, Tex., has announced.

The company adds that civilian models will be available for commercial delivery when military production permits.

In tests for the Army, the powerful helicopter easily lifted a 1600 lb H-23 copter, a 1900 lb L-19 liaison plane, a 2000 lb load of crates and then topped the performance off by lifting a 2600 lb jeep. Featuring single point, center of gravity cargo suspension, the HU-1 sped along at 60 kts while carrying each of the items.

New Saunders-Roe Helicopter

A new British helicopter, the Saunders-Roe P.531 made a successful first flight from Southampton Airport, Eastleigh, home of the company's Helicopter Division.

The five-place P.531 is powered by a Blackburn free turbine engine. Design team of the helicopter is led by T. L.

Ciastula, chief designer, Helicopter Division.

The aircraft was flown by K. M. Reed, the company's Senior Helicopter Test Pilot. He has 2.500 hours in copters.

Record Distance Flight Over Gulf

The longest flight in the history of offshore Gulf of Mexico oil operations was made by Petroleum Helicopters, Inc., of Lafayette, La., when they airlifted a seriously injured oil worker from an oil rig 7 miles southwest of Grand Island.

Although mercy flights are frequently performed over the Gulf, this operation was considered unique because it was the longest flight, more than 120 miles, ever made from an offshore rig to the Oschner Foundation Hospital at New Orleans.

High Performance and Payload Are Goals for Economical Helicopter Operations, Company Officials Agree

"One pound of additional weight costs $143 per year to carry. One hundred pounds would be $14,300 per year," says Glen B. Eastburn, ass't. to the president, New York Airways, in a survey based on 1,100 hours of operation at an average speed of 65 mph and an average return of $4 per ton mile per revenue traffic.

Stanley Hiller, Jr., president of Hiller Aircraft Corp., claims that, "There is now adequate evidence that the light helicopter market will expand substantially as long as industry's technology keeps up with the market's operational and economical requirements. Without doubt, higher performance is the key, because helicopter operators cannot afford the constant mission limitations of inadequate power-performance."

Manufacturer and operator agree on the future aims of helicopter development. Eastburn, in an article written for General Electric, adds that, "The future then of the helicopter is in pay loads delivered at a cost the customer will pay. . .With the help of engineers in power, aerodynamics and fuselage design, we expect the helicopter to attain economic self-sufficiency in certain areas and freedom from federal subsidy." END

NAVICOM

Fifty-Eight Dash Five—Why?

"Cleared to the Bay intersection via Red 23 Syosset Victor 167, maintain 3000. After takeoff, make right turn so as to cross LaGuardia Range 2500, direct Glen Cove, Syosset". We read the clearance back in real pro-style and glared right back at the DC-6 captain in number one position whose expression clearly stated his opinion of light aircraft IFR plan. LaGuardia was 800 scattered, Measured 1100 overcast, visibility five occasionally one to three in showers, light rain. Our destination—White Plains, nestled in the Westchester foothills, was 500 feet and visibility the same as LGA.

To our delight, before we changed over to the tower, the big one advised Ground Control he wanted to return to the ramp, something wrong with number four. Our one was running just fine, so we flipped to 118.7 and the man cleared us for takeoff as a landing Convair turned off.

Off runway 31 at LGA, it takes somewhat of a wide sweep to make 2500 at the low frequency range. Our last shot of the ground was the penitentiary on Riker's Island where an airline DC-6 made an unfortunate, unscheduled landing on a similar miserable winter day.

Switching to 120.4 for Departure Control and turning to follow the ADF as we left 1500, we set up the primary VHF NAV on Riverhead VOR 80 miles east and picked up the Victor 46 radial right away. To our quiet satisfaction, the Departure Controller offered no course corrections whatever and at Glen Cove at 3000, he signed off with the advice that the Center had us "in radar."

Anticipating the cleared routing, we had the secondary NAV all set for the Idlewild VOR radial of Victor 167. Then we flipped our primary COMM to 120.2 and asked New York Center how they read us.

"Five by five! Switch to 125.1!" No doubt to their dismay, we did it with a twist of the wrist and I guess they gave up, 'cause they then cleared us direct Wilton via Victor 91 from Syosset which we were then over.

Thanking the man, we cranked ILT in on the second NAV and as soon as we had the 197° radial bracketed, he says: "Beech Zero Four Delta—New York, turn left heading three three zero for three minutes! What is your visibility?"

Smelling a rat—airborne variety, we told him we were on solid and asked for the traffic. He advised the vector was to put us on an intercept with the HPN ILS and the traffic had separation but he wanted to tell us first in case we saw it through breaks or on top. A real sharp boy!

So, once again we changed the primary VHF NAV—to the HPN localizer frequency and with a second radar vector of 310°, picked up the back course and were cleared direct to the Outer Marker to hold northwest, one minute, left turns. This cross-country was getting to be a real quickie! Reminded me of the old controller's adage—the best thing to do with a light plane on instruments is "get 'im down as quick as possible!" To get back to the job at hand, we cranked in the Outer Locator on the bird-dog machine and said our leave-takings to New York.

Westchester Approach Control gave us also "5 by 5" and had no sooner assigned us an EAC than they cleared us down to 2000 and then for approach.

The guy ahead of us reported underneath at 1100 msl and in no time at all we were the same and had the runway in sight.

A quick check of our gas showed we were fat—thanks to ATC—so we declined the county's hospitality and asked for an IFR back to "La-Chargia." Just to show you how much better things are these days in ATC, we hadn't yet arrived back at the Outer Locator on our "missed approach" procedure at 2000, when we were jacked up to 3000, 4000 and then 5000 feet.

ATC must have had their fill of us by now because we were cleared right over to LaGuardia Approach Control with a clearance via New Rochelle direct the Idlewild radio beacon.

Once again, a quick snap of the wrist and we were set up on the RWC homer, the IDL 011° radial as a check. We heard rather than saw, an American trip go over us approaching New Rochelle, so we listened real good on the frequency when he reported over at 6000.

Not too many little guys show up on this high road into New York so maybe we were a little mite slow getting to IDL. Anyway, the controller occasionally confirmed our position by radar, as a sort of "get along, little dogie" routine.

He was pressurized too, because as we reported over the IDL beacon, he pulled the cork all the way down to 2000 feet and pointed us right at Flatbush! We fooled him—told him we "had the cabin down back at New Rochelle!" I half expected some airline driver on the frequency to ask if we were that new Beech jet!

Anyway to finish the story, over to tower and "report at the Outer Marker!"

Just for the change, we put the other NAV receiver on the LaGuardia localizer and cross-banded with the tower, the ADF on Maspeth LOM of course. Incidentally, compared to a smooth trip up to Westchester, it was rougher than a cob coming down and the occasional heavy rain had a queazy semi-frozen look to it as it hit the windshield. The wind was stron and gusty from the north, all of whi is preparation for telling you abo one of the worst approaches ev made. This time, we were glad GC wasn't lookin'—PAR being out f some reason.

Anyway, we were underneath at t LOM and so the weird approach didn matter except that as we crossed t localizer on each snatch at it (I hes tate to call it a bite), the visual che with the ILS runway confirmed t agreement of our instruments. Ni to know if we had needed them.

The other fellow said the usual kin things about rough air, flying fro the right seat, etc. Anyway, we sai we were out checking the equipmen not the pilot. If you have ever ma a bad one, you know just how unco vincing this can sound!

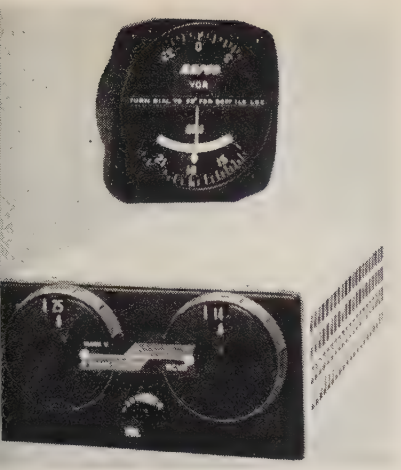
Which brings us to the point of this. A story of a very short, ve minor instrument operation? A litt hangar flying? Not at all!

The point is simply this—we co ducted a full IFR operation in a hig density area—the worst, the Ne York area! Under at least avera poor flight conditions, rough a strong wind almost always abeam o course, at least a score of frequen changes all over the VHF band, n merous ATC changes, the works cluding at least one reasonably l ILS approach. AND, throughout, never used one piece of TSO'ed el tronic equipment!

Frankly, it is the height of folly go "joy-riding" on a bad IFR day in high density area. And ATC h enough to do with other traffic. B this was NOT in any sense "joy-ri ing," rather a literal demonstrati that CAB proposal 58-5 is founded the erroneous concept that a set environmental manufacturing standar are the best means of obtaining acc rate, safe and reliable airborne co munication and navigation.

We still feel that, for consistc IFR operation, any pilot should obta the best equipment available with his means. There are already on t market numerous equipments meeti TSO or better standards and at pric undreamed of five years ago but engineered before 58-5. But, as wi many equipments now flying f years, safety is the result of good d sign, good maintenance and go operational judgment and cannot ju be bought at a price.

For this test, we used the equi ment of a manufacturer who has l in the fight against 58-5 even wh manufacturing equipment that TSO'ed, the Sapphire 1016 line. W used Narco's familiar Mark II Om gator and the new, remarkable 5 w Mark V with the CS-3A VOR/ILS dicator, plus a Lear ADF-12.



ARCO'S MIGHTY MIDGET, *the MARK 90/190 transmitter-receiver and the CS- VOR/ILS indicator combine 5 watts rstal communication and complete VHF v.*

With the Mark V's 90 channel trans- it, 190 receive, and VOR/ILS capa- lity, a completely dualized NAV/- OMM installation can be shaped up a 6"x6½" panel mounting plus dual dicators under 29 lbs.

Both in-flight checks and laboratory sting have consistently proven that arco's IFR-qualified navigation uipment (specifically exempting the FR/NAV super-Homer) is well with- any accuracy specs that anybody s ever specified for in-service cock- t environments! As Narco's person- le Bill Heritage (the "other fellow") ints out, the shock-resistant capa- lities of the Mark V unit exceed at of any instrument panel so that is specification becomes meaning- ss. Also, to meet TSO, they would ve to de-rate the xmtr to 75% out- it or about 3 watts. They have run e Mark V for thousands of hours, nging away at the full 5 watts thout failure, an indication of bet- r user service than trying to break through a tight ground station squelch circuit with a theoretically more reliable but weaker 3 watts!

We can debate single-engine or light-twin IFR, 2-pilot operation, ice, thunderstorms, etc. But as to 58-5, it seems that Narco has an overwhelming answer!

[Ed. Note: The above report was flown and written immediately prior to the information of FAA chief Quesada's indicated "pocket veto" of Proposal 58-5.]

Circle No. 68 on Reader Service Card

Largest VORTAC Order Accelerates Short-Range NAV Program

Announcement of a new order for VORTAC ground station equipment, exceeding $15.6 million, will add 196 installations to those previously ordered and bring the total to 328. Earliest deliveries are scheduled for the fall of 1961.

Despite recent statements of Air Transport Association as to lack of future need for DME-type facilities, at least one major airline has contracted for the new airborne equipment for its new jets. Federal Telephone and Radio division of ITT announced that their airborne VORTAC equipment, weighing 31 lbs is now going into American Airlines' new Boeing 707s.

CAA-sponsored development program of general aviation airborne DMET offers indications that weight will be about 25 lbs and cost under $1500, and require about 20 amps at 13.5 vdc.

The recent International Symposium held in Washington and Indianapolis to sell VORTAC as the short range navigation system to the other nations in ICAO, revealed the advantages in DMET to ATC in reducing separation standards, hence increasing greatly the capacity of the system. Similarly, DMET (VORTAC) approach procedures, similar to those developed with the earlier civil DME, will literally take the shackles off current straight-in minimums usually limited to one or two direction landings at any airport.

Not resolved apparently is the problem of necessary additional multi-runway "transition-to-visual" ground aids usually associated with straight-in minimums! Terrain clearance criteria may also hinder this desirable goal, but would not detract from the value of a straight-in approach to such a runway even at circling minimums.

It was suggested that re-commissioning of civil DME installations, the CAA checking and approval of approach procedures and their use by civil DME equipped aircraft during the interim of transition to VORTAC, would give civil aviation a significant break in preparing for full VORTAC use prior to completion of airline and military deliveries or production delivery of the general aviation equipment.

For general aviation, Dr. Leslie A. Bryan, Chairman of GAFPG, noted over 35,000 VOR airborne equipments are in use, that more than 24,000 general aviation pilots are IFR rated and that virtually all multi-engined and many thousands of single-engined general aircraft are fully instrumented for IFR operation. He regretted that general aviation, lacking experience with the new DMET, was in no position to evaluate it.

Based on the estimated capabilities of the VORTAC system, D. D. Thomas of the Office of Air Traffic Control, CAA, described a three-layer, separate but compatible airway route structure adapted to the operating needs of the various types of aircraft. Basically, these will be: from the ground to 15,000 msl and 9 miles wide; from 15,000 to 30,000 msl and 14 miles wide; and above this 30 miles wide to 75,000 ft msl.

Linear separation standards would

GURE 1—*Use of orbit to provide separa- on between aircraft approaching same fix different courses.*

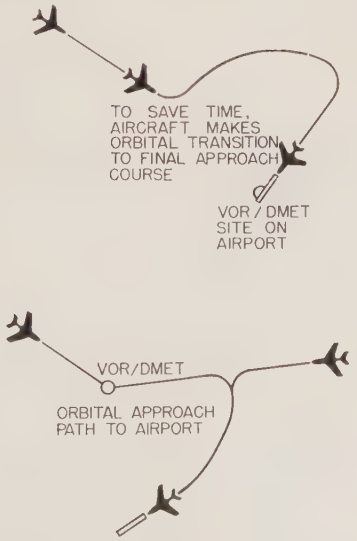

TO SAVE TIME, AIRCRAFT MAKES ORBITAL TRANSITION TO FINAL APPROACH COURSE
VOR / DMET SITE ON AIRPORT
VOR/DMET
ORBITAL APPROACH PATH TO AIRPORT

FIGURE 2—*Use of DMET for orbital approach to airport, initial step in lowering circling minimums.*

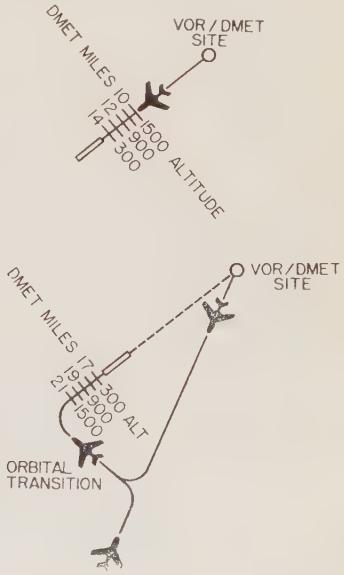


FIGURE 3—*Use of DMET data to set up proper glide slope on radial approaches to airport.*

vary from 5 miles on departure with a substantial speed differential in favor of the lead aircraft to 20 miles enroute between similar aircraft DMET-equipped and position reports at intervals of 20 minutes or less.

Circle No. 66 on Reader Service Card

Aircraft Electronics Association Backs 58-5 Proposal With Amendments

Most of the publicity given the CAB 58-5 proposal (that all electronic equipment used in IFR flight be TSO'ed) has been strongly adverse.

The general feeling is that the proposed regulation, in that it would virtually require public aircarrier standards, is primarily intended as a traffic-restrictive measure. Second, the outstanding safety record of business flying plus the normal effect of the laws of supply and demand already seen in the latest offerings by the aviation radio manufacturers—all suggest the redundancy of such a regulation.

The other side of the picture, sustaining the published purpose behind the controversial regulation (greater assured accuracy and safety on the airways) is ably presented by the AEA in a letter to the Board and to one of the prominent radio manufacturers fighting 58-5.

"We feel that . . . some regulation specifying minimum performance and maintenance standards for . . . equipment used in IFR flight is necessary and will be specified in a regulation at some early date. . . . We should present the necessary information required for rewriting 58-5 into a practicable and workable regulation."

". . . agree that the TSO requirements are too stringent for this type of equipment (general aviation) . . . and the installation of radio in the airplane is the joint responsibility of a properly rated airframe mechanic and properly qualified aviation radio mechanic . . . and could be accomplished by (the former) provided it was checked out and signed off by (the latter) before flying IFR."

"We recommend . . . (58-5) . . . with a stated allowance for an adequate delay period for compliance. We further recommend inclusion of a clearly defined method for securing temporary approval for . . . equipment now in use . . . which has proven its service accuracy and reliability during years of satisfactory operation and maintenance history, i.e.;

'Equipment currently manufactured and installed within two (2) years . . . be temporarily approved . . . providing it meets minimum performance standards (outlined below) . . . in no case not to exceed six (6) years from date of this regulation'

". . . a clear and concise statement as to what constitutes major and minor (to be done by airframe rated mechanic) repairs (to radios) must be made. This is the crux of the situation and will take the combined efforts of the industry. . . . As is well known, in certain cases, the replacement of a vacuum tube can change the accuracy of a navigation receiver.

". . . recommend that inspections of radio repair stations (Part 52) be made by an authorized representative of the Administrator who has had specialized training and experience . . .

". . . a sample Inspection Manual for Radio Repair Stations recommended and approved by the Administrator . . . not mandatory but as a help and encouragement to certification of additional radio repair stations.

"A specialized team of electronics specialists (CAA/FAA) should tour all unapproved radio shops and actively assist and advise them in obtaining their approval.

"Present regulations covering bearing accuracy checks of VOR (airborne) equipment should be enforced and extended to cover other items of navigation equipment used for instrument flight."

Minimum Performance Standards Tests

The Aircraft Electronics Association proposed the following test requirements for temporary approval of electronic radio equipment for IFR flight:

The equipment must be adjusted, calibrated and installed in accordance with the manufacturers' instructions. Since the tests involved are actual flight tests, accuracies will depend also upon the ground equipment calibration. Each test should be conducted on at least two different days, on at least two different ground station combinations and repeated sufficiently for five (5) sets of data on each ground station combination.

A. **VHF Communication Equipment**
At minimum instrument altitude on a typical airway, satisfactory communication must be maintained with the appropriate ground station at the maximum distance between stations.

B. **VOR Receiving Equipment**
At minimum instrument altitude on a typical VHF airway, satisfactory bearings with errors not exceeding $\pm 4.0°$ must be maintained at maximum distance between stations.

C. **Low Frequency Receiving and Direction Finding Equipment**

1. **LF Receiver**
At the minimum instrument altitude along a typical LF airway, readable range position and identification signals must be received at the maximum distance between stations.

2. **ADF**
At the minimum instrument altitude on a typical LF airway, satisfactory bearings must be obtained to an accuracy of $\pm 5°$ fore and aft, and station passage indications must be within ± 1 mile of actual visual passage.
Also, cross bearings at intersecting airways must indicate po tion within the confines of t intersecting airway.

D. **Marker Beacon Receiving Equi ment**
During a typical flight on a ty cal airway and including a sim lated instrument approach, au and/or visual indications of pas ing over the 75 mc Z fan inn and outer markers must be ava able and must be easily identifie

E. **ILS Localizer Receiving Equipme**
During a typical simulated I approach, satisfactory localiz signals must be available from least the outer marker inbou These signals must be sufficient accurate to bring the airpla to within 100 feet laterally of t center of the localizer runway.

F. **Auxiliary Equipment**
Any and all auxiliary equipme which affects the operational u of the primary equipment me tioned, must not affect the p mary equipment beyond the a curacies specified.

In order to evaluate the test resul the errors in the series of tests shou be averaged for each equipment a the average should not exceed t limits specified.

In conclusion, AEA suggests th the minimum radio equipment for I flight should include:

A. Dual transmitters including nece sary frequencies for propos flight.

B. Dual communication receivers wi necessary frequency coverage f proposed flight. (These receive may also be used for VHF na gation.)

C. Dual navigation receivers—at le one of these receivers must capable of VOR and ILS localiz reception.

D. Single LF or ADF receiver wh may be included in (C) above.

E. Single marker beacon recei (May be part of another receive

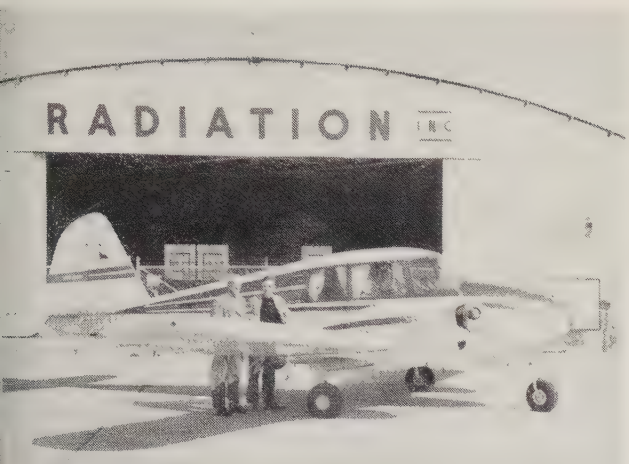
"Runway Visibility—300 Feet!"

In the more than a decade that h passed since WWII, there has been great deal of talk of "all-weathe operations. Radio-navigational a proach aids achieved finite accura Approach light systems to assist t transition from gauges to conta have been very well developed. T goal is almost in our hands. Only few links are missing.

One of these is the absence of ad quate runway touchdown lighting, t infamous "Black Hole." Pilots w remember landing at night by t old-type field floods, with the arthrit beset night-watchman operating t "shadow bar," will confirm that had different problems then. Ne came the runway floods and af dropping out a few times from lan ing on top of the low ground ha these aids died a natural dea Everybody learned to let themselv down gently on the runway with t help of the gymnasium-style paral bars, the runway lights. This is s

Try SAND IN YOUR SHOES!

by Ruth Freckleton



OMPANY'S APACHE, *shown here with pilot Robey Green (right) id Ralph Bickford, is used in emergencies to aid employees' milies, thereby increasing management-employee goodwill.*

Progress with scientists in building a multimillion dollar industry started with "Sand in their shoes." Turning ieir backs on a cold Washington drizzle, with a $25,000 ankroll and a determination to stake out a future under the innier Florida skies, two electronics engineers staked out in elbourne, Florida, only 15-miles from the present Missile est Center. The pair had spent nearly 20 years accumulating ie funds, and their ambition and dreams were to create a ew industry. The skeptics have witnessed these men, Homer . Denius, now President of the organization and George S. haw, Vice President–Engineering, further cement their iendship and build their firm to rapidly approach a pro-uction volume of between eight and nine million dollars year.

The organization now boasts nine plants employing about 00 persons, including some 200 engineers, who got "sand in ieir shoes," following Denius and Shaw to Florida.

"We have found some of the best engineers in the busi-ess," says Homer Denius, "right here in Florida. The in-entive of Florida living, coupled with the importance and ie challenge of the work we are doing, makes it relatively isy for us to attract outstanding engineers."

Radiation acquired their first plane, a Piper Apache, in ugust 1954, and during two years of operation flew 197,256 iles.

Convenience of travel has never been the purpose of an irplane with Radiation—it is strictly a matter of dollars nd cents. Company policy requires a minimum of three assengers before a trip will be authorized. They have figured iat three passengers may be carried for the same cost as ommercial airline fare. Exceptions to this rule are rare and nly then in emergency.

The Apache became so indispensable, the company bought 560 Aero Commander. This gave longer range and higher ayload. Two years of operation with the Commander have alked up 226,489 miles, representing 677,239 passenger iles.

This airplane is fully instrumented for all weather operation and less than 1% of scheduled trips has ever been delayed or cancelled due to weather conditions. This is a good percentage because most operations cover twenty-one states other than Florida, where contract sales engineers have to travel on a regular basis for negotiations.

Chief pilot is Robey Green, former airline pilot, whose wife, Charlotte, and 3-yr old son, Glenn, are always on hand to see Robey off and greet him upon his return. They have their own little "radar" operation to indicate Robey's return.

Besides Melbourne, Florida, where the main office is located, they operate from Orlando and a private airport, Radiation (formerly, Malabar), which is closed to normal traffic. At the latter airport, antennae are tested and developed, as well as propagation, reflectivity, countermeasures and radar system studies for the military. A major portion of the work is classified. It is difficult to get there except by plane.

This is one company that treats its employees in a real family fashion. When a member of the company-family needed assistance, an emergency flight was authorized. A young son of an employee was flown to Augusta, Georgia, when a stomach infection was discovered. Another time, an employee's wife had had many diagnoses of a leg infection and it was decided she had to go to Cincinnati for treatment. From there, she was then flown to Duke, North Carolina. Unfortunately, the treatments failed and the leg was amputated, but every effort was put forth to help her. In an effort to save a young daughter, the family was flown to the Cancer and Leukemia Research Institute in New York City. Yes, while maintaining its leadership in development of electronics, this company is one that does not forget the individual!

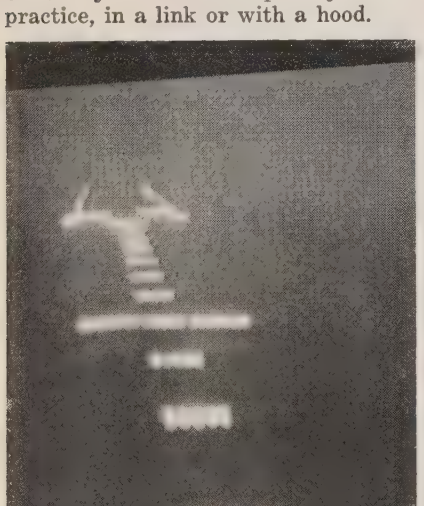
In discussing the growth of their dream, Denius and Shaw hesitate to predict the future, but other people are looking forward to a brilliant and growing Radiation, Inc., of which the airplane is an integral part.

READY FOR FLIGHT *in Aero Commander are (l-r), George Shaw, V.P. Engin'g; Homer Denius, Pres.; Bill Dodgson, V.P. Contracts.*

considered "no sweat" on a halfway decent or clear night, especially with the fine landing lights available today.

But take a real dirty night with a lot of moist foreign matter in the atmosphere, a first-class hi-intensity approach light system draws you confidently out of the base. Then it dumps you unceremoniously into a black, apparently bottomless pit between two onrushing lines of bright lights. Their greatest value is as a reminder that you are rapidly running out of runway!

This, then, is the problem that AMB is currently attacking at Atlantic City at the National Aviation Facilities Experimental Center. Their latest weapon was unveiled recently in the form of the DALTO (Doman-Approach-Landing-Takeoff) Simulator. First reported by Skyways in April 1958 Navicom, the Dalto was primarily intended as a pilot trainer for that portion of an IFR approach remaining after you touch bottom at your minimums. Some pilots will attest that this is often the hard part of the job. The ILS part you can practice, in a link or with a hood.



"LIGHTS IN SIGHT!" *RVR 2600 feet? Two hundred and a half? A real low one? Not at all! Just the view from the cockpit of a simulator IFR approach as the "approach lights and runway threshold" of the Dalto realistically pass "underneath."*

The AMB staff, under the capable direction of Col. Wm. S. Cowart, Jr., NAFEC Director, quickly recognized that the Dalto, attached to a regular flight simulator, was ideal for testing all sorts of runway, approach and touchdown lighting. Using a moving belt on which are painted fluorescent markings that duplicate any desired combination of runway lights and markings, reactions of pilots as well as lighting experts would reveal factors and values costing many dollars and man-hours in a test runway installation. Using a TV camera linkage, the pilot sees through his windshield the reproduced picture exactly in reference to the attitude and heading of his "aircraft" as he manipulates the controls!

Varied approach conditions simulating anywhere from a 300 foot ceiling to virtually zero, and a Runway Visual Range of 300 feet to 2600 feet are within the capability of Dalto, according to Ward D. Davis of Doman.

It is possible to simulate a "low pass" or if desired to impress the results of a "below glideslope" condition, to carry the simulation to the point of a premature "touchdown."

The belt technique which was invented by Dr. F. G. Breckenridge and Mr. Amos Lewis of the U. S. Nat'l. Bur. of Standards, enables AMB to employ a system of belt magazines each of which can be prepared off the simulator to demonstrate any number of experimental lighting systems and test pilot reactions.

Dr. H. Richard Van Saun, aviation psychologist, Operations Analysis, will direct tests and score results.

Under the direction of Mr. Hans H. Giesecke, Systems Analysis, the Dalto will function as an engineering tool as compared to the more usual concept of a training device.

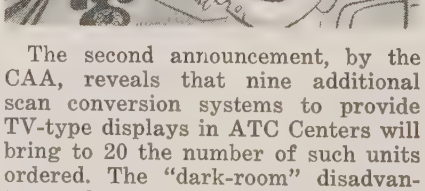
Circle No. 70 on Reader Service Card

Radar Emerging Into Daylight Viewing

The further development of bright viewing radar for both airborne and ground viewing is indicated by two recent announcements.

Bendix-Pacific division of Bendix Aviation Corporation reports that their new Bright-Line Daylight Radar Indicator completely eliminates the awkward and traffic-dangerous hoods previously required of all cockpit radars. Currently planned to replace earlier units used on Air Force aircraft such as the Columbine (Presidential plane) and troop-cargo transports, the indicator weighs less than 16 lbs, is 15" long and has the same, or 4 inch viewing area.

Giving sharp, television-like images even in strong sunlight, the brightness can be controlled by the user.



The second announcement, by the CAA, reveals that nine additional scan conversion systems to provide TV-type displays in ATC Centers will bring to 20 the number of such units ordered. The "dark-room" disadvantages of present ATC operations have greatly hampered the much-needed speedup of the ATC operation. All conversions should be operational by late Spring or Summer.

New York, Washington and Chicago will be first, followed closely by Los Angeles, Atlanta, Oakland, Detroit and Fort Worth. An additional scan conversion system will be installed at the ADC radar facility at Palermo, N. J., and the display information "piped" in to the New York Center.

Circle No. 67 on Reader Service Card

Taxi and Takeoff Clearances to be Clarified

According to The Journal of Air Traffic Control, official publication of the Air Traffic Control Association, the currently working revision of Part 60 C.A.R., will include a clarification of the legal status of taxi and takeoff clearances.

Not infrequently, very active pilots which usually means professionals of either airline or corporate aircraft tangle horns with ATC tower people as a result of a misunderstanding of a taxi or takeoff clearance. As practices do vary between low density and high-density airports despite persistent efforts for standardization, what is safe and acceptable at one is highly "verboten" at the other.

This has resulted in regionally issued instructions to controllers to append to all taxi (for takeoff) clearances a "stopper" or instruction to hold short! In a recent case, while pressing for a finding of a violation of other parts of CAR 60, the CAA attorneys passed up the charge on a pilot who took off without a clearance. According to the ATCA General Counsel, Oswald Ryan, it appeared that the absence of any specific ATC instruction to hold clear or not to takeoff was the nub of the matter. This would seem to be confirmed by CAA's subsequent instructions to its personnel.

As a matter of due caution, it is still desirable that any business pilot lacking the battery of legal talent available to airline pilots of the major aircarriers and ALPA, be especially attentive to the terminology of an ATC clearance or instruction received.

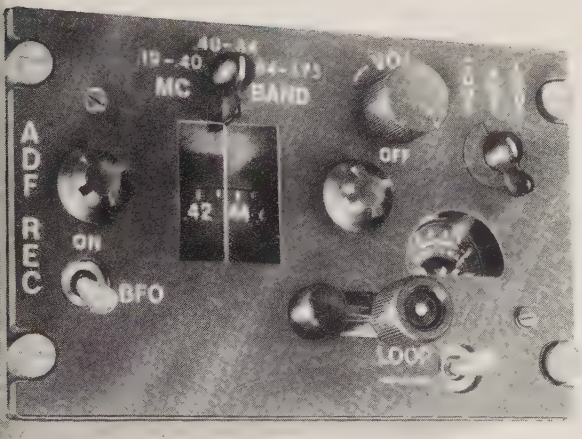
It is expected that the new form of CAR 60 will expressly require a landing, takeoff or taxi clearance at all control airports. Business pilots may have already observed that occasionally an airline pilot will elect to abort a landing on an obviously clear runway when mere radio congestion blocked out receipt of a formal clearance to land. This oft-termed "Philadelphia Lawyer" approach (no offense to that fair city intended—where did the term originate?—Ed.) may become SOP (Standard Operating Practice).

Also, it will be made clear that clearance to *taxi to* an active runway shall not be considered clearance to *taxi on* that runway.

Transistorized Portables

CAA action in NOTAM'ing use of these handy receivers in flight (Skyways Nov. Roundup) intended as caution—not a ban! Business aircraft crews in better position than airlines to explore this situation, preferably in VFR weather.

ARC'S TYPE 21A AUTOMATIC DIRECTION FINDER



TYPE 21A ADF WEIGHS ONLY 19.7 POUNDS
mponent Unit Weights: Receiver, 6.8 lbs.; Loop, 4.3 lbs.; Loop Housing, 0.5 lbs.; Indicator, 1.3 lbs.; Control Unit, 1.6 lbs.; Power Unit, 5.2 lbs.;

As every pilot knows, a reliable ADF is still a basic and useful navigation aid. Throughout the world there are some 60,000 transmitters that offer pin-point guidance, over land and sea.

ARC's Type 21A ADF can be depended upon for precision homing under long-continued use in humid tropics, frigid northlands or burning deserts. It is one of ARC's outstanding contributions to air navigation. Its low weight (less than 20 pounds) and compactness make dual installations practicable even in light twins. If you plan to modernize existing equipment or are purchasing a new aircraft, specify the Type 21A for a long term investment in air safety.

Ask your ARC dealer for a quotation on this and any of the other ARC equipment listed below.

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Circle No. 34 on Reader Service Card

General News

YOUNG AIRLIFT PASSENGER *gets assist from William A. Duthler, originator of fund raising plan, as still younger passenger and E. L. Bates, of March of Dimes, await them.*

When the 1959 March of Dimes gets under way next month, hundreds of private and company plane owners and pilots throughout the nation will turn out in force to help the National Foundation's new program get off the ground. They will be contributing their services and equipment in March of Dimes "Airlifts," flying passengers on short hops in an airborne campaign to raise funds for a new, expanded attack against disease and crippling. The airplane rides average two dollars for adults and one dollar for children. All proceeds go to the March of Dimes.

Originated two years ago by William A. Duthler, president of the Kent County Pilots' Assn., Grand Rapids, Mich., the "Airlift" is a major event at local airports all over the country. "It has stimulated tremendous public interest in flying wherever it has been held," says Duthler. "The Airlift has created good will for local airports, caught the imagination of local news media and raised thousands of dollars."

"We've had the enthusiastic support of local airports, gasoline companies, the Civil Air Patrol, pilots' associations, Auxiliary Police, Jaycees and other civic-minded organizations. The CAA does not require that pilots have a commercial license to carry passengers for pay when all the proceeds go to a charitable organization. We've raised as much as $1,800 at a single airport," Duthler said.

Corporation airplanes, helicopter transports—just about everything with wings—are getting people who never before have flown into the air, and they are helping thousands who might never have the opportunity to walk without the March of Dimes.

Duthler advises that in every county there's a volunteer campaign director who will help plane owners, pilots, airport managers and others plan the operation.

The March of Dimes is held January 2 to 31. "The success of the Airlift depends upon heavy advance publicity," says Duthler. "If you want to get people out to the airport, you have to let them know what's going on and when it's going to happen. You'll have a lot of fun and be doing a lot to protect your own kids and help crippled children all over the nation. Give the March of Dimes an airlift."

FCC Amends Aircraft Radio Station Identification Card Rules

As a result of opposition by the National Business Aircraft Association and ARINC (Aeronautical Radio, Inc., an industry cooperative organization that provides air-ground communications and equipment standards services to aircarrier and business aviation fleets), the Federal Communications Commission has revised a proposed ruling that would have made prominent cockpit or cabin display of the radio transmitter license card a mandatory requirement in all aircraft, including business aircraft.

An alternative was suggested that would not necessitate this undesirable requirement, especially in aircraft where no partition separates pilots and passengers.

NBAA and ARINC proposed, and FCC accepted, the following amendment to Part 9.118 (b), FCC Rules:

"The current authorization for an aircraft radio station shall be posted prominently in the aircraft or *shall be kept with the aircraft registration certificate.*"

DETERGENT OIL NOW APPROVED BY CONTINENTAL MOTORS!

Superiority of Gulfpride Aviation Oil Series D Confirmed

CONTINENTAL MOTORS CORPORATION, back in 1955, launched an extensive research program which included the testing of existent and experimental aviation oils.

The purpose of this program was to determine which oil assured the best performance *under all operating conditions.*

As a result, Continental recently issued Service Bulletin No. M58-8 announcing the approval of *detergent oils* meeting their new rigid Specification, MHS #24.

Gulfpride Aviation Oil Series D not only meets, but surpasses the specifications established by Continental Motors.

What does this mean to you? It's an official documentation of the effectiveness of detergent oil for aircraft engines.

It bears out what Gulf has been saying since 1948: Gulfpride Aviation Oil Series D is definitely superior in coping with sludge, varnish, and carbon formations. Your engine stays *clean* and *safe* . . . goes longer between overhauls.

Wouldn't it be wise for you to change to Gulfpride Aviation Oil Series D now? Get it at the airports where you get friendly, efficient Gulf aviation service.

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Service, Inc.
Santa Monica, California

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TSO'd for all present and future IFR needs • Panel mounting in all aircraft • Digital tuning • Crystal controlled • Low power requirements • Light weight • Available now

Airline standards of quality in nav/comm system performance, reliability and safety are now available to **all** aircraft owners. Collins new panel-mounted equipments are less than nine inches long — short enough to panel mount in any single engine or larger aircraft. Receiver, transmitter, omni converter and power supply use the same components and undergo the same reliability and environment testing as the highest quality airline equipment.

51X-3 VHF RECEIVER — 190 consecutive crystal controlled channels from 108-126.9 mc • front panel squelch and audio controls • provides VOR and localizer service when used with the 344D-1 • contains necessary control circuits and switching for glideslope channel selection • front panel edge lighting • weight 3.25 pounds.

17L-8A VHF TRANSMITTER — 90 consecutive crystal controlled channels from 118-126.9 mc • 3 watts power output • front panel edge lighting • weight 2.5 pounds.

344D-1 OMNI CONVERTER INDICATOR — Left-Right VOR and localizer indicator • To-From indicator • VOR course selector • Reciprocal bearing reading • completely transistorized • self powered from either 13.5 or 27.5 volt line • weight 2.4 pounds.

427B-1 and 427B-2 POWER SUPPLY — Supplies power for 51X-3 and 17L-8A • contains IF amplifier, audio amplifier and modulator for receiver and transmitter • provides extra audio inputs useable for interphone • 4.5 watts of speaker audio output • transistorized power section is maintenance free, operates quietly, causes no noise in receiver • 427B-1 operates on 27.5 volts and 427B-2 operates on 13.5 volts • weight 5.0 pounds.

BASIC SYSTEM—The 51X-3/17L-8A/344D-1/427B system package provides professional IFR services at a cost of $2370. Total weight is only 13.15 pounds. You can install the 51X-3, 17L-8A, and 427B COMM System immediately for only $1395. The 344D-1 can be added to your aircraft soon after. A marker receiver, the 51Z-2, is available at $640.

DELUXE SYSTEM — Collins finest complete IFR/ILS system package for single and light twin aircraft consists of the 51X-3 Receiver, 17L-8A Transmitter, the 427B Power Supply, 344A-1 Omni Converter, 331H-1 VOR/ILS Indicator, 51V-3 Glidescope Receiver and 51Z-2 Marker Receiver. This complete system can be installed in your aircraft **now** or, if desired, equipments can be added over a period of time. The additional functions supplied by this system increase the cost to $5595 but make available complete professional airline equipment to the light plane owner. Total weight is 40.25 pounds including shockmounts.

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FAA Chief Cites Defense Needs As Vital to Airways Operations Structure

In a brief but lively talk before the 3rd Annual Convention of the Air Traffic Controllers Association (ATCA), FAA Administrator "Pete" Quesada pointed out that the action of the military in relinquishing direct control of their existing sphere of airspace usage was only possible through the assurance that the single airspace agency would properly credit the vital needs of the national security.

In this regard, Mr. Quesada partially confirmed the fears of many air traffic controllers that they are slated to be subjected to some of the regimentation associated with the uniform. Many strongly protested that if they had desired to be in the military, they would have remained in service, instead of attaching themselves and their futures to a civilian career.

Mr. Quesada clarified the issue by noting that the purpose in the move was purely to assure continued service in event of a national emergency, that they would not be "in uniform" in a peacetime agency operation and that the benefits of this class of career service paralleled some of the major objectives of the air traffic controllers such as the much-sought 20-year retirement. This would, in effect, place a price on this benefit of involuntary global service, military-style personnel administration, etc. The air traffic controller has previously based his contention for more equitable pay and retirement on the now widely accepted thesis that air traffic control is an occupation that makes extraordinary demands upon the responsibility, capability and physical stamina of the controller. Normal aging processes, without the acceleration of the on-job pressures and furious tempo of ATC, are recognized to be an early limiting factor on safe airways operations.

The FAA head stressed that he and his staff were well aware of these facts and anticipated the need of equitable, humane adjustments of personnel policies to assure no hardships inflicted on incumbent civilian personnel of varying tenures of service. New personnel would enter into service under the new rules and old personnel would probably be allowed to indicate optional service status without any recourse to "shotgun" techniques to influence their decision. He pointed out that with expanded responsibility, would come greater opportunity.

The subject of enabling legislation to erect and implement the organizational structure, personnel and facilities, airspace utilization and rules elicited an estimate of six months or more before FAA could be considered fully transitioned from the CAA/CAB structure that was set up by the Aeronautics Act of 1938.

Awards were made to CAA administrator James Pyle and Dave Thomas, Chief of the Office of Air Traffic Control for their leadership in the resolving of the many problems that have faced ATC in late years.

Mr. Stanley L. Seltzer, Executive Director of ATCA, reported that VFR Traffic Advisory Service to jet airline operations is keeping abreast of the growing need.

Controllers Convene On Airspace Utilization and Nav/Comm Requirements

At the annual ATCA meeting in Washington, the controller's association discussed many operational and airspace user matters that are of vital importance to business aviation. Inasmuch as these men are seriously regarded by both legislative and administrative agencies as most technically competent to advise on airspace, and navigational /communication problems, their opinions can drastically affect all future airway operations.

At the meeting, "working groups" including controllers from all sections of the country conferred and then passed on to the Council, the governing body of the association, their recommendations as to the line to be taken by ATCA.

Positive Control

As a broad guideline, it was stated that a prime fundamental in a positive control program is that all traffic be equally capable of participating to the extent that ATC procedures or clearances require. Should controllers be required to take into account the varying capabilities of certain pilots or aircraft with limited navigation or communications equipment?

On the subject of the extension of positive control airspace, a question was raised as to any participation of non-instrumented pilots or equipped aircraft in such an airspace on a "clear weather basis," inasmuch as ATC could get involved in alternate provisions to assure separation if such pilots encountered IFR weather.

Generally ATCA seemed to favor that all aircraft operating in future positive control segments be required to have the specific capability of direct communication with the controlling ATC function.

In a segment of positive control where radar coverage is available, it was felt desirable but not mandatory that radar beacon equipment be in the aircraft.

There was a strong implication of the imminence of positive control expansion in the discussion as to ATCA's views towards contemplated testing of positive control in terminal areas, problems of communications with crossing traffic on positive control route segments, etc. Generally, they seemed to feel that personnel and ATC equipment limitations would be a limiting factor in such drastic implementation of additional or lower altitude positive control areas.

Procedures and Regulations

It was pointed out that CAB has already adopted "the standard altimeter" setting (29.92) for all operations within the Continental Control Area. This poses problems of separation for ATC between the lowest level of the CCA and highest normal airways altitudes, of an altitude layer to be regarded as a "sterilized" transition layer between, changes of station pressure used in normal operations. Also, in certain western areas, anticipated lowering of the CCA floor may aggravate the problem before a solution is found.

Clarification of ATC Terms

Considerable discussion revolved around clearances vs ATC instructions. This one has long puzzled pilots, many of whom take all clearances in the light of almost mandatory instructions. A suggestion to employ the term "ATC instructs" was not looked on with favor and the conclusion seemed to be to make judicious use of the word "immediately" to advise a pilot of the desire for prompt compliance, as on altitude change. This would not detract from pilot prerogative but place the burden on him of notifying ATC immediately if he deems prompt compliance to be unsafe.

An amusing sidelight emerged here in that, considering the possible "semi-militarization" of ATC, the suggestion of more "police" authority and the problem of rank, a typical new era ATC communication might sound something like this "ATC orders you to climb immediately, SIR!"

A recent popular hangar-flying subject has been the confliction between the new "hemispheric" VFR cruising altitudes and the frequent need for ATC to employ any altitude level on airways. Preference was indicated for a blanket endorsement of the policy of avoiding such conflicting altitude assignments wherever possible.

A desire was expressed for the government to take the lead in acquainting the public with the specific meaning of such ATC phraseologies as "cleared to land", "number two to land", etc.

It was revealed that early application of DMET to ATC procedures is under vigorous investigation at this time.

Many controllers suggested AirGuide publication of the problem of pilots misinterpreting an instrument approach clearance to an airport in VFR conditions as a priority sequence over VFR traffic in the same approach or pattern!

Communications and Navigations

An apparent paradox arises when it appears that the controllers, while favoring an elastic policy on direct-Center discrete communications frequencies where "common-calling" channels are a minority. seemed to urge a require-

Part of the business and executive fleet operators and distributors brought together for the first time. Occasion: Champion's First Annual Ignition Clinic.

They Swap Know-how

A report on aviation's first ignition clinic for business-fleet operators –an unusual exchange of technical knowledge and field experience sponsored by the Champion Spark Plug Company

by

E. DEAN PRICHARD
Associate Member, Aviation Writers Association

"This is Tom Appleton of Reeve Alaska Airmotive at Anchorage speaking. We have a serious engine operation problem under certain conditions. We have tried everything, we have gone everywhere to find the solution. We have been unsuccessful.

"Now here's the situation . . . "

A hundred and fifty men dedicated to *business aviation* – brought together for the first time – listened quietly.

Eighteen were manufacturers and suppliers. Ten were Champion Spark Plug Company's internationally recognized ignition experts. A hundred or more were fleet operators and distributors, each with data wheels, notebooks and microphones at easy reach.

Some made notes, began figuring. Mr. Appleton's problem was complex, highly technical. It involved the ignition system, fuels, oils, the spark plugs.

One then another picked up his microphone:

"What type fuel do you use, Mr. Appleton?"

"What is your average time between take-offs?"

"Do you use burn-out? What is your procedure?"

They questioned Mr. Appleton at length, then virtually cross-examined one another. It was a free and thorough exchange of information – some of it so new it had not yet been made public; much of it simply

RUSS H. BIEGEL, Fort Worth, Tex.—11 years Air Force, 5,000 hrs. flight engineer B-29, B-50 and B-36; project engineer for ignition during B-36 development; holds commercial multi-engine pilot certificate; joined Champion in 1952, airlines and military Service Engineer for 13 central states, made Central District Supervisor in 1956.

GENE C. ASHENFELTER, Fort Worth, Tex.—Ignition Overhaul shop foreman at Bengal Air Depot in Calcutta, India, during the war; ignition specialist for the Air Force at Wright Field, transferring in 1952 to the Maintenance-Engineering Division as Supervisor of Aircraft Ignition at Kelly Field; joined Champion as Sales-Service Representative in 1956.

EARL G. KOEHLER, Palo Alto, Calif.—Air Corps technical instructor during the war; powerplant engineer for United Air Lines, specializing in ignition; joined Champion in 1951 as service engineer for the airlines and military in the West, in 1956 was made West Coast Aviation Supervisor for Sales and Service in 11 Western states, Alaska and Hawaii.

TONY B. ORGAIN, Menlo Park, Calif.—21 years' aviation experience; 16 years with the Pacific Division of Pan American, six years as chief mechanic and 10 years as powerplant service engineer specializing in ignition, carburetion and engine performance; holds A & E and Flight Engineer licenses; joined Champion Aviation in 1956.

the "old know-how" drawn from the experience of veteran specialists.

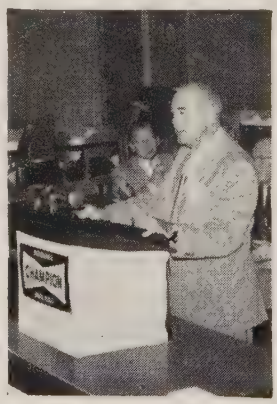
"Yes sir, we have tried that," Mr. Appleton replied to most remedial suggestions. "Yes. We have checked that . . . "

Finally — after analytic discussion of spark plug lead and carbon deposits, engine operational procedures and heat-range remedies — Mr. Appleton took the mike, said:

"Gentlemen, I think you have given me the answer I seek!"

The solution had come from the pooled know-how of an earnest group of aviation experts — there to give and there to learn. Ignition engineers . . . oil company fuel researchers . . . representatives of aircraft engine and parts manufacturers . . . fleet operators with years of experience in aircraft engine operation under all kinds of conditions — all working cooperatively as one to improve respective products and services and to improve aircraft engine performance.

These business fleet operators had gathered from near and far — an Avianca electrical systems and instruments engineer flying all night from Colombia, S.A., to attend, for example.



R. L. "DOC" ANDERSON
Champion Aviation Service Manager

L. R. "LARRY" LENTZ
Assistant Director of Engineering

Russ Biegel, Champion's Central District Supervisor, left, discusses Texas business flying with (L/R) Ed R. Tucker, General Aviation Supply, Houston; A. G. Powell, Dallas Airmotive magneto shop; Eugene Ashenfelter, Champion; Clifford J. Hudder, Rep., and George A. Clark, Mgr., Dallas Airmotive.

They tackled many such weighty technical problems that day, problems dealing with everything from fuel additives to jet igniters. All aspects of engine operation and maintenance involving spark plug performance were examined for solutions to individual business flying problems.

This was Champion Spark Plug Company's First Annual Ignition Clinic for business and executive fleet operators. It was held in Toledo, O., the same week as this year's 14th Annual Aircraft Ignition Conference, a four-day Champion-sponsored question-answer session with airline engineers.

The first annual national Ignition Clinic for business and executive fleet operators was an out-

RON A. BLACKMAN, Atlanta, Ga.—In aviation since 1943, attending East Oregon College and Embry-Riddle School of Aviation; served ten years with Eastern Air Lines as a mechanic, maintenance representative, chief mechanic and planning supervisor; became a Champion Spark Plug Company Aviation Representative in 1956.

DOUG A. SHROPSHIRE, Miami, Fla.—17 years of powerplant experience; test and experimental engineer, Wright Aero Corp.; powerplant engineer, American Airlines; powerplant engineer, A.T.C.; Director of Engine Overhaul and Powerplant Engineering, National Airlines; joined Champion, 1954; was made District Supervisor in 1956.

TOM D. ALLEGRETTI, Port Washington, N.Y.—20 years in aviation. Maintenance and engineering graduate of the Boeing School of Aeronautics (1938). Eastern Air Lines mechanic; Chief Inspector of Maintenance and Overhaul for Colonial Airlines; Chief Inspector for Eastern at LaGuardia; Aviation Representative with Champion since 1956.

HARRY C. ARCHER, Cresskill, N.J.—Experimental flight test for Grumman during the war; Assistant Chief Engineer for National Airlines; joined Champion in 1953 as Airline Representative for Eastern United States, Canada and Europe, was made Aviation Supervisor covering Sales and Service for 17 Northeastern states in 1956.

Comparing notes on the day's events are (L/R) Larry Lentz, Champion; Richard B. Davey, Pres., Alaskan Aircraft Equipment, Anchorage; L. C. Nichols, UAL foreman; Tony Orgain, Champion; E. M. (Ted) Preston, Champion, Calgary; L. M. Krentz, UAL aircraft engineer.

growth of the local Ignition Clinics which individual Champion representatives have been staging nationwide in their districts since 1954.

Champion is the only spark plug manufacturer that provides this consumer service to the business and executive aviation industry.

These clinics are all the more unique because they are totally devoid of commercial "pitch." As the district representatives work out spark plug operation and maintenance problems with those attending their individual district clinics in cities throughout the country, the name "Champion" may not even be mentioned. Color slides, cutaway drawings of engine components and so forth cover all types of equipment.

At this first annual national clinic – held in downtown Toledo, near Champion's headquarters plant – those engaged in the manufacture and supply of everything from engine parts to fuels met to exchange freely and openly with fleet operators the experience and technical know-how that may have cost them hundreds of man-hours and thousands of engine-hours to acquire. They shared knowledge even to the point of baring to analytic criticism some yet-secret product developments.

Indeed, these know-how symposiums are unique in many respects.

To the people at Champion, however, the district and national ignition clinics are part of a deep tradition of special services to the consumer.

The First Annual Ignition Clinic – this extension of the individual district clinics—was moderated by R. L. "Doc" Anderson, Champion Aviation Service Manager, and L. R. "Larry" Lentz, Assist-

Charlie Speers, Managing Director, Champion of Canada, talks north country business flying with (L/R) Morris Stewart, Sales & Service, Aviation Electric, Montreal; Naylor C. Sargent and F. N. A. Ramsay, Sales & Service, Aviation Electric, Vancouver, B.C.; Don McHugh, Sales & Service, Leavens Bros., Toronto and Alex McNaughton, Purchasing Agent, Leavens Bros., Toronto.

Talking shop are (L/R) Lloyd W. Freeman, Ford Motor Co. Air Transport, Detroit; J. Patrick Murphy, Sales Mgr., General Aircraft Supply Corp., Detroit; H. C. Schuler, Mgr., Remmert-Werner, Inc., Toledo Express Airport; Paul E. Charles, Chief Mech., Chrysler Corp., Detroit; C. T. Service, Chief Pilot, and J. J. Solomon, Chief Mech., Libbey-Owens-Ford, Toledo Express Airport; Chris L. Chaffee, Chief Mech., Flight Operations, Champion, Toledo; William Meadowcroft, Ford Motor Co., Dearborn; Tom Allegretti, Champion.

ant Director of Engineering. They and the panel of eight Champion district representatives were introduced in an opening address by Burns R. Maus, Champion Aviation Sales Manager.

Before the national clinic was thrown open to group discussion, Mr. Lentz gave a slide demonstration on design and development factors in aviation spark plugs, tracing the role of testing and clinical field experience in combating such things as flashover, lead- and carbon-fouling and preignition.

Anticipating questions on jet engine performance, he traced jet igniter development from its beginning, when Champion worked with General Electric on experimental jet engines in 1942. (Working since with many jet engine manufacturers, Champion has remained in the forefront of jet igniter development, manufacturing more igniters than any other jet igniter manufacturer.)

Doc Anderson addressed the forum on lead-fouling problems associated with take-off, climb-out and cruise-power combustion conditions and invited oil company representatives present to acquaint the group with fuel developments relating to engine and spark plug performance.

"Corrective procedures, improvements, must come from you as well as from us," Mr. Anderson told the fleet operators and suppliers. "That's why the success of this clinic depends on you—your discussion, your participation in the solution of individual service problems."

During the open discussion sessions, the Champion district representatives were put on the spot for answers to several highly technical questions. They were *expected* to have the answers to ignition problems—and they did. Though constantly on the move calling on customers and holding their individual clinics from coast to coast and beyond, they nevertheless manage to maintain a remarkably close working relationship with Champion plant production and engineering research.

"Gadgeteering" at one of the clinic displays are (L/R) H. B. Sherman, Salesman, The Don Horn Co., Memphis; Don Horn, Owner, The Don Horn Co.; Samuel H. Lutley, Director of Maintenance, U. S. Steel, White Plains, N.Y.; Ron Blackman, Champion; Harry F. Eaton, Salesman, The Don Horn Co.

They are all eminently qualified, with years of practical experience as well as technical training.

For a close, firsthand look at some of the developments discussed at the national clinic, many of those attending inspected Champion's new million-dollar engineering and research buildings adjacent to the Toledo plant. The new facilities—29 engineering and research offices; two drafting rooms; six laboratories for research and experimental work in electronics, chemistry, metallurgy and mechanics; and one building devoted solely to the engine laboratory—are the largest and most modern in the world for the developing and testing of spark plugs.

Here, design developments are originated, tested and eventually become incorporated features of new Champion Spark Plugs. And this is the clearinghouse where know-how is pooled, evaluated and repackaged for presentation at future ignition clinics, district and national.

The result is improved operating and maintenance procedures for the best possible in spark plug and engine performance – know-how exchanged for service gained.

Inspecting a spark plug cleaner and tester are (L/R) Benjamin A. Venables, Chief Mech., National Steel Corp., Dravosburg, Pa.; Julius W. Baker, Asst. Chief Mech., Alcoa, Pittsburgh, Pa.; Lee S. Cox, Pres., National Aviation Supply, Pittsburgh, Pa.; Harry Archer, Champion; George A. Harrig, Chief Mech., Gulf Oil Corp., Pittsburgh, Pa.; Edgar H. Cornman, Mech., Westinghouse Air Brake, Pittsburgh, Pa.; Frank B. Eibl, Mech., Alcoa, Pittsburgh, Pa.; Tom Allegretti, Champion.

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ment for specific airborne VHF/UHF frequencies on discrete channels at high density zone airports where at least one common-calling channel is still available today.

This would impose a real hardship on many personal business aircraft pilots whose discrete channels number usually less than 24-36, rarely fly even limited IFR and do not equip for it.

100% Two-Way Radio Requirement Opposed

It was reassuring to observe the average controller's approach to a requirement for 100% two-way radio at *all* control airports. Many pointed out that, excepting obvious high-density airports, this would impose an unnecessary burden on flight training operators and inexperienced personal pilots whose major activities are on weekends when scheduled and business flying is at a minimum. Some favored a requirement tied to hours of darkness and low visibility, but others pointed out that virtually all airport collisions occur in daytime CAVU. An average reaction was to not impose more control for its own sake but for demonstrated safety only.

Although purely a high-density airport problem, there was much agreement on the need for a second Ground Control frequency for IFR clearance handling in heavy traffic periods when radio congestion is at its worst with much breaking up of transmissions.

HF/LF Communications and Navigation

Indicative of the more mature and less selfish viewpoint of the association's membership this year was the reaction to a proposal to discontinue HF/LF domestic communications channels and facilities. In addition to ATCA's reaction that this would unduly penalize operations of general aviation aircraft, it should be noted that the scheduled aircarriers occasionally have been known to employ these facilities as a back-up during a VHF outage.

The same policy applied to retaining the L/MF color airway system for VFR operations.

Radar Traffic Advisories—IFR and VFR

It was reported to the group that an unexpected and wholly impracticable result of the spreading radar traffic advisory program is pilot expectation of ATC-initiated "steers" or collision-avoidance instructions. Most IFR-plan pilots understand that such vectoring is only done on request of the pilot, also the limitations of Airport Surveillance radars lacking altitude information. Enthusiastic participation by VFR pilots in the Indianapolis experiment has resulted in chaotic congestion on the light aircraft common-calling channels to the detriment of local air traffic control. A discrete frequency within the capability of these airborne equipments was suggested to relieve the working channels of this overload.

It was universally urged that any VFR Radar Advisory position be staffed with a qualified, trained radar controller whose experience would enable him to deal with situations bound to arise if such services are expanded.

A potentially dangerous situation was mentioned in that GCI (military) controllers giving Radar Traffic Advisory service and radar vectoring to both military and civilian jets are often neither ATC-rated or radar-control qualified!

The flying public will be happy to learn that almost universally, the controllers urged that Precision Approach Radar installations be maintained as a safety and traffic expediting ATC tool. Similarly, they indicated that whereas fluorescent paint marking of all aircraft is a help in spotting aircraft ATC-wise, its major benefit seemed to be safety to the pilot.

COLE H. MORROW, *Special Projects Administrator for the J. I. Case Co. (NBAA member) and former Executive Director of NBAA, discusses with his assistant, Frank Wilson, the intricate travel problems of "Operation Jigsaw." Probably the largest, commercial company "airlift" on record, J. I. Case Co. transports its 5,000 worldwide dealers to a premiere of the firm's farm and construction equipment lines at Nassau in the Bahamas. In addition to Case Co.'s own business aircraft, they draw upon a literal air armada of four-engine aircraft from United, Northwest, National and Delta Airlines.*

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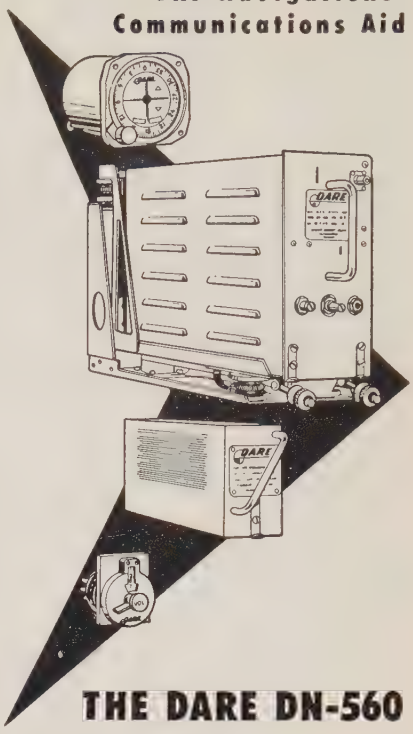

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THE 360 CHANNEL TRANSMITTER-RECEIVER TYPE 210

As air traffic increases in volume, the question of safe and efficient control becomes more and more important. A vast increase in the number of assigned radio frequencies has been required in order to facilitate air-ground communications.

Only a few years ago pilots could operate with 10 or 20 channels. Later frequencies were increased to 80 or 90. Plans now call for 360 frequencies — enough to meet the need for years to come. In view of this channel increase, ARC now offers an all-channel, flight proven transmitter-receiver (Type 210 Transceiver) covering all 360 channels. The powerful 15 watts guarantees optimum distance range and the knifelike selectivity assures freedom from adjacent channel interference. Provision has been made for the selective use of single or double channel simplex. In the former, both reception and transmission are made on the same frequency; in the latter, transmissions are made on a frequency 6 megacycles higher than the receiving channel. There is no wait between receiving and transmitting for re-channeling.

This is ARC's latest contribution to air safety. Ask your dealer for a quotation to include a single or dual installation, along with other units of ARC equipment listed below.

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The Law Behind the Skyways

by Albert Woodruff Gray, *Counselor at Law*

Liability of Fixed Base Operators and Municipal Airports

An increasing number of situations are occurring wherein owners and operators of business aircraft are finding out belatedly their rights in regard to storage, whether base or transient. Many are surprised to find that certain states and municipalities do not conform to the usual pattern regarding "hangarkeeper" liabilities. Also, the fixed base operators in those states vary in their approach to the subject. This month we have asked Mr. Gray, an experienced legal editor to discuss this pertinent subject.

Hallowed by tradition is the rule of law that an airport or fixed base operator has the duty in the safe keeping of an airplane "to exercise due care to prevent damage thereto and is liable for the damage resulting from the failure to exercise such care."

For gasoline and servicing, a Cessna plane was left with a fixed base operator in the state of Washington. Instructions of the owner were that the keys be *removed*. The plane was put in the hangar but, contrary to these instructions, the key was left in the ignition. That night the plane was taken from the hangar, took off with an intoxicated pilot, crashed and was totally destroyed.

Here the fixed base operator, sued by the owner for his loss, was held liable. As authority for its decision the court referred to an Indiana incident occurring over fifty years before. A horse and buggy was hired from a liveryman with the stipulation that it be returned the following night and be left that night in a livery stable. This was not done. The horse was stolen and the customer held by the court liable for the loss.

"The agreement of the customer required him to put the property in a livery stable. It may therefore be said that the disappearance of the property was the proximate result of the customer's failure to exercise that care over the property *which he had agreed to exercise.*"

By this same rule of law is governed the liability of a municipal airport for the loss or damage to aircraft entrusted to its care, *except* insofar as that liability may be modified or denied by the statutes of the state. Such an incident was before the United States court in Montana only a few months ago, in which it was said of such statutory exemptions:

"In its governmental or public capacity a municipal corporation is an instrument of the state or a local depository of certain limited and prescribed political powers, to be exercised for the public good in behalf of the state rather than for itself. Acting in such capacity it is *not* liable for wrong doing."

This rule which the court quoted here supplements a provision of a statute of *that* state that, "No action or suit for wrong doing shall be brought or maintained against a state or municipality thereof, or the officers, agents, servants or employees of the state or any municipality thereof on account of any act done in or about the construction, maintenance, enlargement, operation, superintendence or management of any airport or other air navigation facility."

This *exception* [exemption] made here by this state's statute to the time honored law (that a depository of any goods is liable for their care) lies *in* the statute which fact is highlighted by another recent case of this character in a Texas court less than three months later. Damages were awarded a plane owner against the City of Corsicana for the destruction of a plane by fire in a municipal hangar through the negligent burning of grass by an employee of the city in the vicinity of the airport.

Of the liability *here* the court said, "Our Constitution denies to legislative bodies the right to arbitrarily abolish causes of action against municipalities where such causes of action are well established and well defined in the common law.

"Perhaps it would have been more in keeping with the language of the constitutional provision, had we said that it prohibited legislative bodies from arbitrarily withdrawing all legal remedies from one having an action well established and well defined in the common law, but the practical result would have been the same."

REFERENCES

Lewis v. Jensen, 235 S.W.2d 312, Washington, September 5, 1951

Holland v. Western Airlines, 154 F. S. 457, Montana, August 27, 1957

Wren v. City of Corsicana, 309 S.W.2d 102, Texas, October 31, 1957

GREENHOUSE PATTER

By Torch Lewis

[*As this column is put to bed, (an erotic publisher's term), Capt. Chuck Banfe has just landed his dripping Mooney at Idleberg, completing in his stocking feet a frustration-fraught flight around the world in 40 days, chopping in half the record set by David Niven and Cantinflas in 1957. Sputtering from pillar to post with his mechanic racing ahead by airline, Capt. Banfe suffered more discomfiture than anyone since Adam took a nibble of his spouse's apple strudel. Forced down in a Corsican vineyard on his first leg, friend Chuck should have pulled off his socks and pitched in with the grape pressing instead of spending the next 39 days scaring himself out of his wits. But he finally made it and we can all stop sweating him out. In all seriousness a tribute is deserved to the intestinal fortitude and "stick-to-it-iveness" of plane and pilot, a rushed and hardly-prepared "sub" for Br'er George Williams, scotched by the Canadians who have interpreted their anti-self destruction laws to include these latter-day Lindberghs.*]

Every pilot with a trace of Walter Mitty in him has read with interest and admiration the rash of recent tales of derring-do involving the one person, one airplane, one fan crossings of Pacific and Atlantic. Whereas a non stop Los Angeles to New York used to be considered quite a trick for a Bonanza or an Apache, it is now old hat as the go for broke boys are falling over one another to see who can go the farthest. That so very few have augered in for one reason or another is a real tribute to the superior men and superior machines produced by the USA.

Peerless among this breed is an aging grandfather named Max Conrad who is sometimes mistook for his garrulous friend, Max Karant, the AOPA nabob. Conrad, father of ten, has crossed the ocean alone over forty times, of which six crossings were made in the Comanche and Tri Pacer. He describes his 43rd attempt as a "routine delivery" of an Apache and he is using Madrid because "they don't charge any landing fee."

Conrad claims that crossing the ocean is "easier than flying from New York to San Francisco," admits to having been "scared a few times" and says that "crossing the ocean is easier if you do not let yourself think about it too much."

One thing that always bothered me was that even when I was goggle deep in the study of celestial navigation, I was no great shakes at the subject and skinned through with the fervent hope that I would never have use for a sextant save that of keeping papers from blowing off my desk a la Commander Nash (Don't Go Near the Water).

Conrad, eyeing with interest the increasing number of private pilot pond crossings, is offering soon a special course at Max Conrad Aircraft Sales, Lock Haven, to civil pilots desirous of flying to Europe in their own aircraft. Conrad's longest flight was a 4700-mile affair from New York to Palermo fastened on to a Comanche. Incidentally, if

(*Continued on page* 64)

NEW 220-MPH CESSNA: 5 CABIN CHOICE

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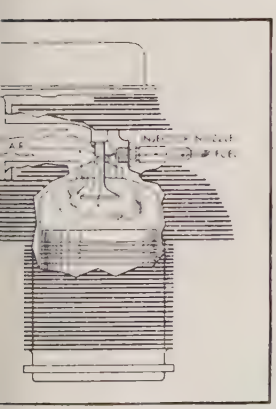

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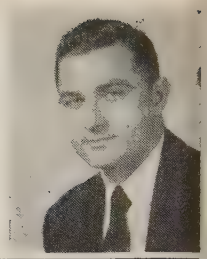
SAFETY DIGEST

RICHARD W. GROUX, *Assistant to Excutive Director NBAA*

Compiled and edited from leading air safety publications issued by military, naval, airline, government agencies and from private and business pilots' experiences.



Twin Beech Tale

Here's a story that has a moral for our western colleagues. The misadventure is told in the following report taken from APPROACH.

At 2:30 A.M. a Navy Twin Beech approached an airport in the Mid West after a flight from the West Coast. "The co-pilot called the tower 10 miles south for landing," said the pilot, "and they told us to call down wind for runway 18 . . . the co-pilot called at the 180-degree position . . . and the tower told me I would have a crosswind from the left of 10 knots.

"I. . .corrected. . .with left wing down, right rudder. I made a smooth touchdown and immediately after touchdown experienced a violent swerve to the left. I recovered from this with right rudder and brake. I used full flaps on landing.

"I was then on the left side of the runway and experienced a second slight swerve to the left which was taken out with right rudder and brake. Then I had a third swerve to the left as the tail was coming down and I tried right brake and rudder with no effect. I then applied left throttle but at this time the airplane went off the left side of the runway and rolled about 150 feet with the yoke back in my lap trying to hold the tail down. At this point the plane tipped up on the nose and on its back."

Only the pilot sustained any injury and this was a cut forehead and bruised eye. The right engine started blazing but was extinguished with foam.

The accident board concluded that the pilot was slow in exercising crosswind landing procedures during his landing rollout. This next sentence of the conclusion explains something of the pilot's condition on the landing. "His slow reaction," said the board, "was caused by a combination of *mild hypoxia and fatigue*." No oxygen was aboard the aircraft but out of the 7½ hours flight preceding the accident the last *5 hours had been at 11,000 feet.*

The board noted that the minimum en route altitude for the last 400 miles was 5,500 feet, and since the weather was good there was no apparent reason why the flight could not have been conducted at an altitude lower than 11,000 feet.

"OBSCURED" . . . What Does It Mean?

Seems as tho' our flying brethren in SAC have busted up some flying machines because pilots insisted on "giving it a go" into an obscured ceiling condition. The COMBAT CREW story that follows sheds much light and proffers sage advice.

The pilot checked the weather at his destination. It was estimated 300 feet, ceiling obscured, one mile visibility. He checked the minimums in the book: 300 feet and one mile. "Great," he said to the copilot, "we got it hacked."

Twenty minutes later, when the altimeter showed he was 300 feet above the ground and GCA said he was one mile out, he was shook up to find he couldn't see the field. Together they opened the throttles to go around and, without them ever seeing anything except brief, disorientated flashes of runway lights, the nose wheel contacted the ground and tore from the aircraft.

They managed to get the KC-97 back into the air; but now they had a definite crash landing to face besides a fuel shortage.

Why didn't the runway show? It's real simple. The word "obscured" means just that; it means the weatherman cannot really see the ceiling because of a visibility restriction, and the word obscured is the approved method of telling you that.

The word is well chosen, Mr. Webster says, "Not distinct, faint, undefined."

Two words in a weather report mean *beware. One is obscured; the other is indefinite.* So Buster, if you have an obscuration you better beware or you'll bust 'er. And this is going to make some folks mighty unhappy with you.

While we are interpreting obscured, do you know what "alternate" means? Well, that's the place you go when it is obscured. Not *after* you tear off the gear and posibly your ear, but before.

And while we are on the subject of alternates, you probably looked into that matter pretty well before you took off, so use the one you've planned on and the one everyone is expecting you to use unless an unexpected weather change renders it unusable. In-flight searching for an alternate can create time-consuming delays, when the word obscuration should have driven you to your planned alternate long before.

Pre-Heated? An Old, Cold Story . . .

Here's a real-life story, as told in USAF's Aircraft Accident and Maintenance Review, about improper oil dilution. This C-47 crew was lucky. Improper dilution and preheating can have more disastrous results.

The thermometer outside operations showed 32° below zero (F) when the crew chief of a C-47 went to start the engines for a flight.

Two days before, the aircraft had been towed out of the maintenance hangar and the engine oil diluted for about four minutes. For the next 40 hours it had remained parked on the ramp in temperatures as low as —40°F, grounded by ice fog. Now the crew chief found the '47 thoroughly cold-soaked, the engines too stiff for a normal start.

After the props had been pulled through by hand for about five minutes, two heaters were used to apply heat to the No. 2 engine, one hose to the accessory section and the other to the front of the engine. (No heat was applied directly to the oil tank.) The heaters ran for about 30 minutes at high blower and a temperature of 280°. No. 2 was then started and allowed to run for 15 minutes.

The crew chief heated and started No. 1 engine in the same way. Both engines were shut down for 20 minutes, then re-started and run for another 20 minutes while the aircraft was preflighted.

By this time the pilot's original flight clearance had expired, and it was necessary for him to re-file. Again the engines were shut down.

When the pilot received his new clearance it was early afternoon, and the outside temperature was —29°F. Engines were started again, checked and put through three feathering cycles. The C-47 made a normal takeoff.

A climb to 12,000 feet was made at 500 fpm. Climb to altitude was normal, 32-in. hg, and 2250 rpm all aircraft instruments were well within operating limits.

It was about 50 minutes after takeoff when the pilot and copilot saw the oil pressure on both engines drop from 60-70 pounds to 10-15 pounds. The pilot immediately declared an emergency to radar control, made a one-eighty for home base, and alerted the crew for bailout or crash landing. Within two minutes after the turn was made, the right propeller ran away. Engine feathering was attempted unsuccessfully. With prop control, throttle and mixture all the way back, prop speed could be reduced only to 1800 rpm. The engineer pulled the emergency shut-off for No. 2 and placed the engine fire extinguishing control on the No. 2 engine position. (Engine oil pressure never dropped below 10 pounds.)

While the attempt was being made to feather the right prop, the pilot made radio contact with an airborne rescue aircraft and reported his position. He then increased power on the left engine to 2250 rpm and 32-in. hg in order to maintain a 500 fpm descent and 120 mph.

(*Continued on page* 46)

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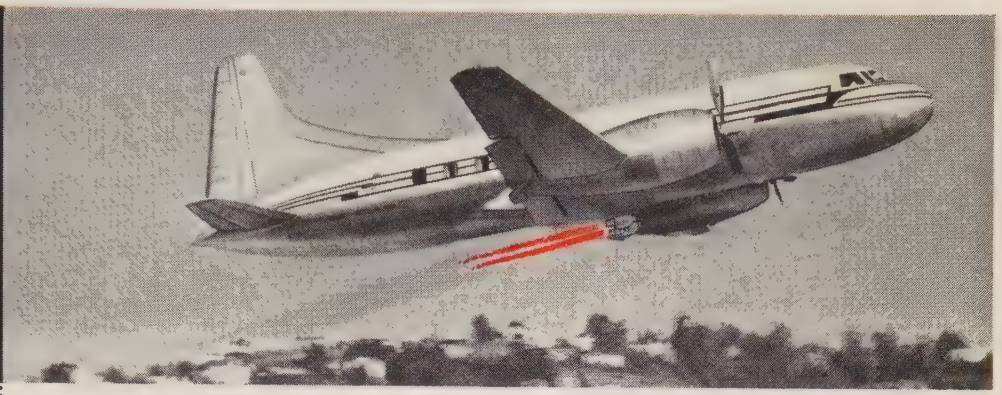

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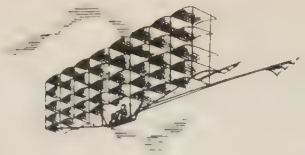

Francis Herbert Wenham, noted English engineer and charter member of the Royal Aeronautical Society, obtained, in 1866, the first patent on a flying machine with superimposed wings, earning for him the appellation, "Father of the Biplane."

STRENGTH IN NUMBERS

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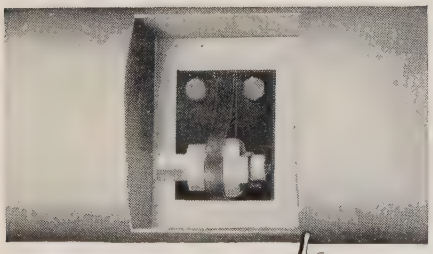

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The situation went from bad to worse when, as the C-47 descended through 4,000 feet the reduction gear housing in the left engine disintegrated. The propeller immediately ran away to 4,000 rpm, and the engine caught fire. The aircraft rolled into a vertical left bank and assumed an exaggerated nose-down attitude. By exerting all their combined force, the pilots were able to bring the floundering plane under control and turn toward an ice-covered river they had spotted.

Primary concern was to keep the plane under control long enough to reach the river. An attempt to feather the left propeller was unsuccessful, and discharge of a fire bottle on the burning engine failed to diminish the flames sweeping across No. 1. The pilot notified the rescue aircraft of latest developments and his plan to land on the river.

Because it took the efforts of both pilots to keep the aircraft under control, flaps were not lowered. Initial touchdown on the ice was at about 80 mph. When the props and tailwheel bit into the ice, the pilot pulled up and slowed the plane to touch down again about 20 yards farther along the river. As the '47 skidded down the ice, the left prop flew off, slicing through the fuselage uncomfortably near the pilot.

The fire in No. 1 had begun to burn out by the time the crew and passengers climbed out of the aircraft, but before moving away from the plane the engineer sprayed a hand extinguisher into the fire. The investigating teams disclosed that both oil tanks were full. There was no oil in the inlet or outlet lines of the engines and the engines themselves were without oil.

The right prop governor was removed and taken back to the base for a bench check, which showed it to be in proper mechanical order. (It was impossible to check the left governor because it had been badly damaged in the crash.)

The board concluded that the engines had failed because of oil starvation, even though the tanks were full, as a direct result of improper dilution and preheating.

The C-47 engines had not been diluted properly for the temperatures encountered. According to the tech order, dilution should have been effected for at least seven minutes.

The engines had not been preheated for a sufficient length of time. Tech orders cannot give specific time requirements for preheating under all conceivable circumstances because of such variables as length of time the aircraft has been exposed, temperatures and wind conditions. Experience teaches, however, that an aircraft exposed to 0°F temperature for a period of one or two hours should be preheated at least one hour; longer exposure to —40°F temperatures, as in the case of this C-47, naturally requires a longer preheat period.

Normal engine starts, warm-up, taxi, preflight and takeoff operations with temperature gages in the desired limits were possible because only diluted hopper tank oil was being used. Since the oil tank was not properly preheated with external heat, the oil in the tank was congealed and would not flow into the hopper tank for distribution to the engine.

After 50 minutes of flight the diluted hopper tank oil, containing approximately six gallons, was nearly exhausted. This was because of normal oil use, a decrease in volume of about two gallons as a result of heat evaporation of the fuel used for dilution and the inability of the congealed oil to enter the hopper distribution system. There was insufficient oil in the system to maintain pressure.

Congealed oil also prevented feathering of the propellers. Takeoff should not be attempted until the props can be feathered at will. The props may feather on the first few tries, but after the diluted and heated oil has passed through the system, congealed oil may not flow through the smaller size lines to the feathering motor. END

Airline Pilots Talk Safety

Probably no group or profession in the country is more safety-conscious than the American airline pilots.

At the MIA Convention last month, the delegates who represented more than 13,000 domestic and international pilots urged federal legislation to require airborne radar on all air transport aircraft. They stated that it "has proven to be a valuable safety device in the avoidance of turbulence, icing and terrain clearance" and also "has proven of economic benefit in more efficient flight operation."

While urging "accelerated progress" toward the development of a proximity warning device (black box), the pilots stressed the continuing need for visual aids to collision avoidance such as the high-intensity aircraft lighting systems such as the Atkins Relative Danger Area light which tells a pilot whether a plane is coming, going or paralleling him!

The airline pilots also took a firm stand against adoption of any ATC procedures without coordinating with ALPA beforehand. Specifically, they objected to the recent combining of civil and military radar to actively control jet airliners, pointing out that assurance must be given that only "qualified" controllers render such ATC services and that their proficiency and equipment be maintained to civil standards. (See Controllers Convene—Page 39)

On another matter the ALPA, while conceding the existence of "pilot error," noted that obviously pilots as a group are not suicide-inclined, hence no such accident "cause" finding is complete until the factor behind such cause is fully identified. To insure this, they are adding a special 8-man team to assist accident investigations.

They stated that the inadequate airport situation and lack of sufficient landing aids could have prevented 12 accidents within the last two years.

NARCO SCORES ANOTHER IMPORTANT BREAKTHROUGH

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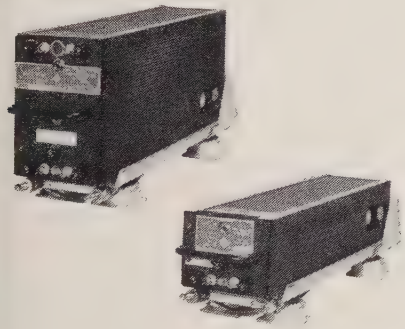

SAPPHIRE 1021 90-560 CHANNEL VHF RECEIVER. The receiver unit of the 1016A is now offered as a separate all-channel receiver with transistorized power supply in a short-height ½ ATR unit. When coupled with VOR/LOC converter, permits rapid, precise crystal controlled tuning to all NAV as well as COMM frequencies. Designed especially for the remarkable "2½ Sapphire" system, that gives unusual NAV/COMM flexibility and rapid switching of functions to relieve cockpit load.

TRANSISTORIZED POWER SUPPLY reduces weight of 1016A by 4 pounds, length by 3½ inches, is nearly twice as efficient as equivalent vibrator units. With no moving parts, malfunction is virtually eliminated. Thoroughly proved in thousands of hours of flight and accelerated laboratory testing.

MORE POWER, LIGHTER WEIGHT, SMALLER SIZE AND EVEN GREATER RELIABILITY have been engineered into this new Sapphire 1016A VHF communications unit. Thanks to the development by Narco of a revolutionary transistorized power supply, this latest addition to the popular Sapphire series of airline-quality equipment is more than ever the logical choice for airlines and executive aircraft users for an all-channel VHF communications unit.

The Sapphire 1016A provides you with a 90 to 360-channel transmitter with greatly increased power covering every channel with 50 kc spacing between 118 and 135.95 megacycles; and a 90 to 560-channel receiver covering every frequency from 108 to 135.95 megacycles, with the all-important advantage of permitting crystal controlled tuning to VOR/LOC navigation frequencies.

Sapphire 1016 series equipment is in scheduled airline use, has been re-specified for the U. S. Air Force's Cessna L-27's and is in use in hundreds of corporate aircraft.

You'll select the Sapphire 1016A because it provides you with all-channel transmission, all-channel reception both NAV and COMM, because it's years ahead in design and reliability, because it's CAA TSO'd for airline use and because it's sensibly priced. See your Narco dealer or write for new brochure.

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National Aeronautical Corporation, Fort Washington, Pennsylvania

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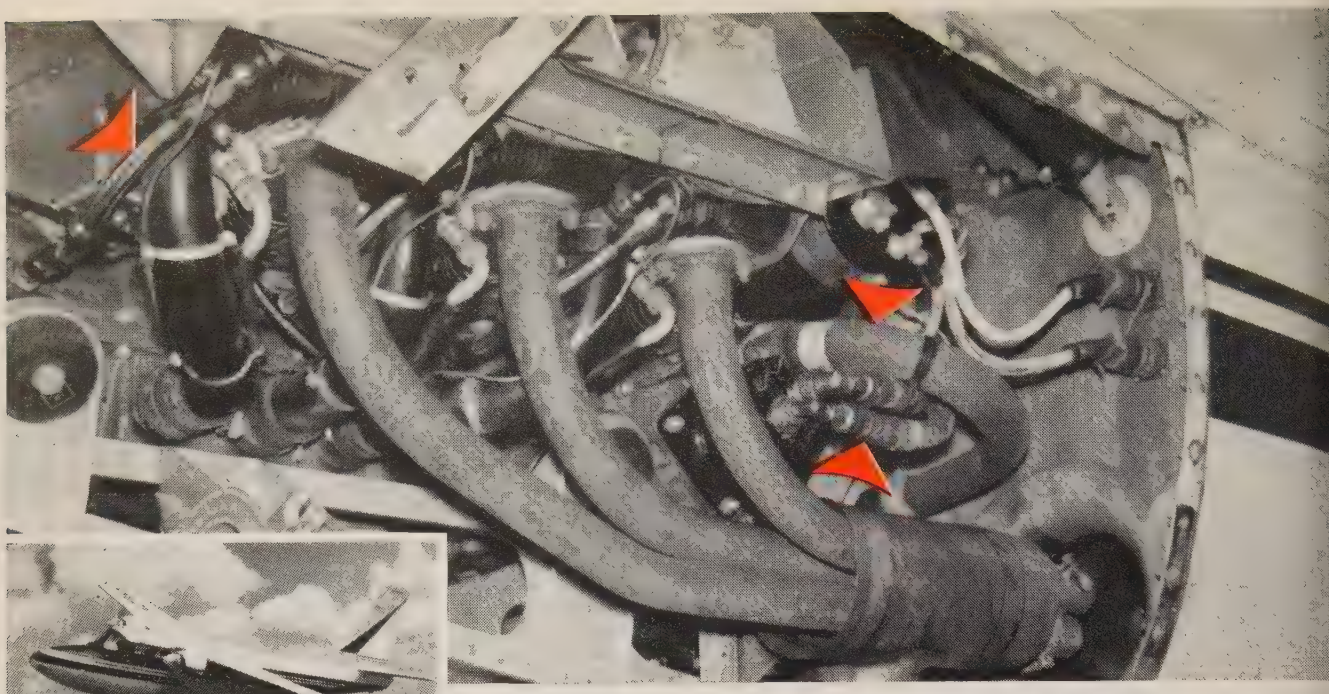
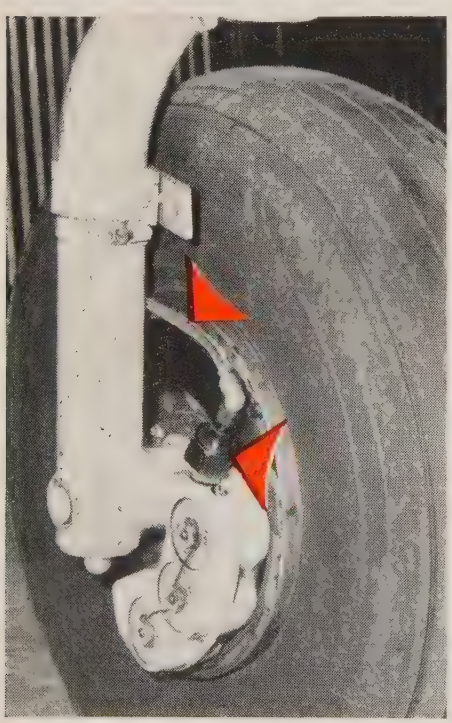


Rocker box drain line (left) and fuel line (right top arrow) replumbed with Aeroquip 601 Hose. Hydrau lines visible under fuel line are fire sleeved 666 Hose of Teflon. Fuel lines are fire sleeved for added safe

Increase Safety, Improve Performance with Aeroquip Hose Lines

Use 601 Lightweight Engine Hose and 666 Hose of Teflon for Engine and Brake System Applications



New wheel brake line using 666 Hose of Teflon has 48% less cubical expansion than previously used rubber hose, thereby improving braking action. Lower arrow points to Aeroquip Self-Sealing Coupling which permits quick connection and disconnection for ease of maintenance.

High performance Aeroquip Hose Lines can increase safety and improve efficiency on all types of aircraft. On a typical overhaul, engines on an Aero Commander were replumbed with fire sleeved Aeroquip 666 Hose of Teflon with patented* ***"super gem"*** Fittings for hydraulic lines and 601 Lightweight Engine Hose for fuel and lube oil lines. 666 Hose of Teflon and Self-Sealing Couplings were also used on the wheel brake system to improve performance and simplify maintenance.

Fly with the added safety and efficiency offered by these new type Aeroquip Hose Lines. Call your distributor or write us for full details.

"super gem" is an Aeroquip Trademark.
Teflon is DuPont's tradename for its tetrafluoroethylene resin.
*U.S. Patent Nos. 2,833,567 and 2,731,279.

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Flattops On The Ground

By Albert S. Burchard

n 1957, eight airline and five general aviation accidents were of the over- n or overshoot type. Among the many fety systems to be examined by the search & Development Section MB) of FAA will probably be civil port runway arresting gear, reversing stems and V_1V_2 notwithstanding.

Power loss on takeoff and hydrau- failure on landing—two bugaboos flying—can be saved from abrupt dings with the installation at civilian ports of a relatively cheap Air Force aptation of a Navy carrier device.

The idea is thought-provoking when application to business and other il aircraft with tricycle gear is con- ered.

The device is an arrester net used the Navy to prevent collisions on owded carrier decks. The Air Force st cast long looks at it during the rean fracas when jet fighters were ced to use short runways. Later, in United States, other Air Force in- llations took it up with great results.

The first Stateside base where the ts were installed was Hamilton Air rce Base, just north of San Fran- co. Hamilton's runways end abruptly the levees which are necessary to ep high tides in San Francisco Bay the field, and many's the plane that nt over. Maj. Gen. Walter E. Todd, mmanding, figured the nets would ve millions of taxpayers' dollars a ar, not to mention pilots' lives.

He found in his command an officer no had seen the nets work, 1st Lt. seph F. Schultz, and they got busy. ie Navy cooperated, and Todd's men rrowed a couple of the $250 nets and enty tons of obsolete anchor chain at was to have been sold as scrap. ien Schultz dug up some old channel ons to hang the 400-foot net between d combed the stockpiles for bungee rd and heavy bolts, shear-pins and ds and ends.

He also found a long length of one- ch steel cable.

It is the cable which actually does e arresting, and the stop is made adual by hooking the cable not to tionary posts but to the twenty tons anchor chain.

The way the thing was figured, a runaway plane hits the net with its front wheel. The net pulls the steel cable up in front of the plane's rear wheels, so that the anchor chain "brakes" take hold. Then pressure snaps on the webbing of the net allow it to expand, and shear-pins on the ends finally let the net snap free of the channel irons, so that it is not damaged.

That's how Schultz figured it, but would it work?

They called for volunteers, and out stepped 1st Lt. James M. Collins Jr., a jet pilot in the 84th Fighter-Intercepter Squadron.

Collins ran a heavy T-33 trainer down the runway. A car clocked him up to seventy-five miles an hour, and he revved her up a little more before smacking the net.

"Felt just the same as when I release the plane's chute when I land," Collins said, "except toward the end. Then the net pulls a lot harder."

Now the net is standard at some Air Force fields, and at least one civilian expert on airport design thinks it would "serve a doggone good useful purpose" if adapted to civilian fields, particularly short ones.

He is Thomas E. Flaherty, district airport engineer for the CAA. Speaking only for himself, and not for the CAA.

"There is a dangerous point on takeoff when engine failure may occur, and in that case the net might really do a lot of good."

"Somebody might get jarred up," he said when asked about the effect of stopping a large plane with the net, "but it would be a helluva lot better than hitting a building or maybe even better than hitting water."

And the net could be adapted, safely and cheaply. It would work on all tricycle-gear planes, though it might foul the props.

It would still be worth it, if it saved the pilot. And several people believe the "flattops on the ground" would do just that.

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IN THE BUSINESS HANGAR

■ PLANESERVICE, INC., Division of The Norman Larson Co., Van Nuys Airport, Calif., completed 100-hr inspection and minor repairs on the L. E. Dixon Const. Co. Super 18 Beechcraft. Neal Finney is their Chief Pilot.

Bob Timm of the Hacienda Hotel, Las Vegas, had additional radio installed in his Cessna 172. He hopes to break the world's endurance record in this aircraft.

West Coast Sales & Service had a Lear L-2 Autopilot with Altitude Control installed in their Bonanza. Pilot is Hal Jarvis.

Morrison-Knudsen Co. had a 100-hr inspection and minor repairs on their D-18 Twin Beech. Pilot is Del Asbury.

Sundstrand Machine Tool Co. flew in for a 100-hr inspection and minor modifications on their Twin-Bonanza and repairs to their radio equipment. Pilot is Bill Buckingham.

G.F.T. Enterprises brought their Super 18 Twin Beech in for an engine change, installation of an oxygen system, installation of Beech Romair scoops on both engines and a 100-hr airframe inspection. Pilot is Danny Jones.

J. W. Johnson of Hammond Lumber Co. flew his Cessna 310 in for repair and calibration of his ADF.

Flying Tiger's Cessna 310 had repair and calibration of their omni system. Pilot is Paul Kelly.

Stoddart Aircraft Radio Corp. had addition of crystals and radio receiver calibration on their Apache.

Lockheed Missiles System Div.'s new Super 18 Twin Beech was in for 100-hr inspection and installation of new 880 channel Collins control heads. Rex Hardy and Charles Tucker are pilots.

Mario Hernandez of Calexico had his Twin-Bonanza in for 100-hr inspection and complete overhaul of the propellers. Pilot is Ralph Thomas.

Hehr Mfg. Co. was in with their F-50 Twin-Bonanza for 100-hr inspection, calibration of the Autopilot and repair of radio units.

Wiley Corn of Imperial Valley brought in his Bonanza for 100-hr periodic inspection and repair of radio.

Ralph Kiewit brought his Bonanza in for 100-hr periodic inspection.

■ **DAVE ELLIES INDUSTRIAL DESIGN**, Columbus, O., will do interior design of Noland Co's., F-27. Firm has designed interiors of two winners of "Flagship of the U.S. Fleet" business awards.

■ **W. H. COFFIN AIR SERVICE**, Whiteman Airpark, Pacoima, Calif., has expanded its Ferrying Div.. Ferrying service of the 15-year-old operation is world-wide. During the 15 years no plane has been damaged.

■ **REMMERT-WERNER**, Lambert Field, St. Louis, Mo., installed lightweight wheel well doors and aileron gap strips on Ontario Paper Co.'s Super-92 DC-3 during an engine change. Fred Hotson is the pilot.

Denison Egineering Co.'s DC3 had an Engine Works R1830-94 engine installed at R-W, Toledo. Larry Lyons is the pilot.

Houston Lumber Co.'s Super-92 DC3 had an R.C.A. AVQ50 radar installed and a 200,000 BTU Janitrol heater with automatic heat controls and ground blowers. Austin Goodwin is the pilot.

Luhr Brothers' twin Bonanza had an engine change. Dinny Heligenstein is the pilot.

TV Associates' twin Beech had installation of an Engine Works R985 engine.

Callery Chemical Co.'s DC3 had ground blowers added to its Janitrol heater. Lou Rinebold is the pilot.

The Ontario Paper Co. Super DC3, at R-W, Toledo, had an eng change and installation of lightwei landing gear doors and aileron g strips. Pilots are Fred Hotson a Andy Gabure.

H. C. Price Construction Co.'s D had installation of Collins 17L7-51 VHF communications, Collins 51 VOR-102 omni and dual A. R. C. Ty 21 lightweight ADFs. Pinky McMil and Ed Thaggart are the pilots.

Kewanee Oil Co. had a DC3 in modification of the oil tanks. Fra Auernig is the pilot.

Falstaff Brewing Corp.'s DC3 h wing inspection and modification a JATO rocket engine replaceme Hank Haddock and Bud Willett a the pilots.

Sperry Gyroscope Co.'s DC3 was for complete rewiring of the ent electrical system, with new R-W el trical and radio color coded junct boxes, new custom radio, instrum panels, complete exterior painting, covering of all control surfaces, 8,0 hr wing modification, new floori new interior, airstair door, fuel a oil tank overhaul, and misc. work.

■ **NORTHWEST INDUSTRIES LT** Edmonton, Canada, reports that w is proceeding on a government c tract for radio installations on t DoT's eight D18S Beechcraft. C tract calls for installation of ARC ADF, HTR10 transceiver, Bendix M 53B marker receiver, BC-347-C In com amplifier, recording units a Collins 51V1 glide slope. Another D aircraft, a DC-3, was in for insta tion of a red flasher unit.

Canadian Pacific Airlines' Dak is undergoing extensive repairs fuselage and floor structure; modifi

(*Continued on page 5*

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Circle No. 26 on Reader Service Card

IRGINIA, YOUR LITTLE FRIENDS ARE RIGHT:

There Is No Santa Claus, Flyer Says

LEARNED THE TRUTH IN FORCED LANDING, PILOT TELLS CHILD

"Virginia, your little friends are right — there is no Santa Claus!"

Thus, Pilot Jasper J. Juggbuster shattered the childhood illusions of his small but maturing daughter (33-20-33) after she caught him in his mail-order Santa suit prior to the annual Dew Droppe Inne Christmas benefit ball for retired aviators.

Gently, the grizzled flyer told Virginia that he, too, once believed in Santa Claus, but learned the hard way that there's no such thing as something-for-nothing.

"The Moment of Truth came to me 10 years ago in a forced landing in a stump-filled mid-western pea patch," Juggbuster related. "I traced my troubles directly back to aviation Santa Clauses who had treated me to cut-rate engine overhauls, half-price 100-hr. inspections, and war surplus parts.

"There in that pea patch, I realized there is no Santa Claus. In this cold, old world you get what you pay for — and, one way or the other, you always pay."

Brushing aside her tears with the back of a grimy little hand, Virginia bravely skipped off to her room to write Santa a note cancelling her order for a diamond-studded tiara.

Virginia was wise beyond her years.

Southwest Airmotive Co.

LOVE FIELD, DALLAS
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Circle No. 27 on Reader Service Card

Bearing Greasers-Pullers Cut Airframe Servicing & Overhaul Labor Costs

These are days when all business including the flying business, keep a sharp eye out for cost cutting techniques. Not only does this widen the spread between income and outgo but it improves the bidding position on much desired but highly competitive new income. When labor costs can be cut to a fraction, it is news—good news!

Such are the new tools designed to remove, install and lubricate airframe bearings in minutes rather than hours. Add to that—unusual accessibility at those familiar "hard-to-get-at" spots plus permanent service to sealed airframe bearings and you have it made.

These fit all K3A, K4A, K5A, KL3, K3, K4, K5, K6, K3L, KS3, KS4, KS5, KS6 and other sizes by special order.

Circle No. 91 on Reader Service Card

Business Hangar

(*Continued from page 50*)

tion to the centre section and the relining with nylon of the cabin.

■ **TIMMINS AVIATION LTD.,** Montreal, Canada, sold a Beechcraft D18S to North Rankin Nickel Mines, N.W.T. The aircraft will be delivered by Capt. J. Amodio after completion of a 1,000-hr check and Day-Glo treatment.

Perini-McNamara-Quemont Construction Co.'s amphibious Otter was recently in for a No. 2 check and other work. The amphibious business aircraft has done excellent job of servicing requirements in Northern Ont.

Switzer Brothers, Inc., manufacturers of Day-Glo paint and Filteray, have appointed Timmins as Canadian distributors for these products. The new anti-collision paint is gaining wide acceptance in Canada.

Quebec Cartier Mining Co.'s DC-3 was in for an engine change. Pilots are "Blackie" Bradshaw and John Sefsik.

Jeppesen and Co. appointed Timmins exclusive Canadian distributors for their navigational equipment.

Timmins announces availability at Kingston, Ontario, of heated hangar accommodations for winter aircraft storage.

■ **THE GARRETT CORP.'s AIRESEARCH AVIATION SERVICE DIV.,** Los Angeles International Airport, has Philips Petroleum Co.'s Convair 340 for a double engine change, misc. service bulletins and interior items. Pilot is Clarence Clark.

World Airways, awarded AiResearch a yearly contract for turn around service, freight handling, inspection and maintenance on their C118 and C-54 aircraft based at L. A. International.

Canadian Pacific Airlines, DC-6A, in for modification to DC-6B configuration and interior work.

Reynolds Metal Co., DC-3, flown in by Pilots Charles Johnson and Moss Hargan for various service items.

International Business Machines' DC-3 received misc. maintenance work.

■ **SPARTAN AIRCRAFT CO.,** Tulsa, Okla., completed modifications on the cabin interior, and exterior painting on Sharp Drilling Co.'s Beechcraft. Chief Pilot is Jay Gentry.

Franklin Supply's DeHavilland Dove, piloted by Frank Ernst, was brought in for a 100-hr inspection on aircraft, engines and instruments.

Reynolds' Metal Co.'s Beechcraft, of Richmond, Va., was in for correction of engine throttle control malfunction. Bud Meredith is Reynold's Pilot.

Pepsi Cola Co.'s Lockheed Lodestar received a periodic inspection on engines, instruments and aircraft, and replacement of de-icer boots. Luke Mosely piloted the Lodestar.

Mesta Machine Co.'s A-26 is back in service after pilot AI Litzenberger brought the aircraft to Spartan for an engine change.

Wood Oil Co.'s Cessna 310, piloted by Dale Smith, received 100-hr inspection on engines, aircraft and instruments.

Murchison Brothers' pilot, W. C. Mims, stopped their Aero Commander at Spartan for radio work.

Ashland Oil and Refining Co.'s Lockheed Lodestar had inspection and replacement of control cables and misc. instrument and radio work. A. B. Berkstresser is the pilot.

Harry Horton had 100-hr inspection performed on his Piper Apache.

Warren Petroleum's Beechcraft received a double engine change and had all engine accessories and propellers overhauled. Claire Kingsbury is Chief Pilot.

■ **PACIFIC AIRMOTIVE CORP.'S** Burbank, Calif., Aircraft Div., completed No. 2 inspection of Fairways Corp.'s Convair 440. Plane flown in by prexy, George Young.

Morrison-Knudsen's LB-30 was in for a 1,000-hr inspection, replacement of windshield, repair of lightning damage, double engine change, new interior, fuel tank resealing and modification of main oil tanks. Milt Donner and Ed Christiansen are the pilots.

Belridge Oil's Twin Beech was in for a 1,000-hr inspection, new interior, double engine change, strip and paint and elevator angle of incidence change. Pilot is Len Mills.

Producers Cotton Oil's Twin Beech, piloted by Bud Miller, was in f installation of Hartzell propellers a stabilizer angle of incidence chan

Catalina Air Transport's DC-3 w in for installation of high-dens seating.

Sears Roebuck's DC-3, crewed George Fleming and Paul Caribe was in for an engine change.

Feldman Oil's Learstar was broug in by John Rich for a 100-hr inspecti

Vinnell Co.'s Twin Beech, w Charles Eaton at the controls, was for periodic inspection and other wo

L. E. Dixon's Super 18 was in f a periodic inspection. Neal Phinney the pilot.

■ **EXECUTIVE AIRCRAFT SER ICE, INC.,** Dallas, Tex., complet work on Dow Chemical (Michig Div.,) DC-3 including installation landing gear wheel well doors a wing root fairing.

Their Texas Div. DC-3, pilot H. E. "Ted" Merchant, was in f periodic inspection, installation of n anti-icer system for windshield a propellers and Day-Glo paint on wi tips, vertical tail section and a over cockpit.

Malco Refineries, Inc.'s Lodestar flying after engine change, new in rior, major overhaul and conversi including installation of new inst ment and radio panels, radio equ ment, Sperry electric auto-pilot, Ja trol heater, 200 amp generator syste electric fluid shut-off valves, Edis fire detectors, PacAero exhaust c lector ring kit, Scott oxygen syste EAS anti-icer system, long range co pit chairs, enlarged cockpit side w dows and overhead windows, four ca picture windows, elevator trim tab Safe Flight speed control kit, extend tail cone kit, Learstar radome Chief Pilot is John Lyons.

Esso Shipping Co.'s Convair 240 w in for 1,000-hr overhaul, periodic spection and installation of Sperry tegrated flight system. Their Conv 340 was in for installation of speed a sound kit, double window panels, engine JATO system and misc. repa Both DC-3's were in for periodic spection and installation of aile gap closure kit; one had engine chan and recovered flight control surfac Chief pilot is E. W. Estelle.

■ **AERO TRADES, INC.,** Ronk koma, N. Y. completed on Lyon, In Grumman Mallard 1600-hr overha double engine change, compl stripping and repainting, reupholst ing of interior, misc. extra wo Chief pilot is Elmourza Natirboff.

Fairchild Engine Div.'s E18S. 1 hr inspection and additional wo Chief pilot is R. L. Rodgers.

American Cyanamid Co.'s Lo heed Learstar. Modification to exi ing Vacuum System, misc. work a installation of Grimes Rotati Beacon. Chief pilot is Willi Shaughnessy.

Republic Aviation Corp. Repai ing of Alouette Helicopter.

Packer Pontiac Corp.'s Grumm

lard. 100-hr inspection, complete viring of aircraft electrical sys-, misc. additional work. Chief pi-is Bob Turner.

uller Brush Co.'s Grumman lard. Installation of additional ra-equipment, complete check of hy-ulic system and equipment, and allation of new Janitrol Heater. ef pilot is Gene Parrott.

incent Astor's Grumman Mallard. -hr inspection and misc. work. ef pilot is Harold Swift.

MERICAN AIRMOTIVE CORP., mi International Airport, Fla., formed annual inspection and re-nsing on Plymouth Oil Co.'s Lear-Mark I. Pilots Jim Hickerson and Phillips flew in from Sinton, as.

. J. Benes & Co. brought their ly acquired deHavilland Dove in repairs.

viation International Corp. ught in their Bonanza for engine airframe repairs. Pilot and presi-t of the company is Bob Myers.

lene Grande Oil Co.'s DC-3 was ught in by Capt. Walter Idel from acas, Venezuela for landing gear electrical system repairs.

exas Petroleum Co. has its C-47 in 8,000-hr overhaul, dual Collins in-ated flight systems installation paint job. Pilots are Bob Rainey George Kaplan.

. F. MacDonald Co. brought their estar in for engine and aircraft airs. Pilots are Jack DeWolfe and Block.

ohnson Air Interests, producers of nson's Wax, stopped for electrical tem repairs on their Aero Com-nder 680 on their way to South erica, which will cover about 00 miles. Harold W. Sumi was the t.

IcDonough Construction Co. ught in their Twin Bonanza for -hr inspection and misc. work. Pi-is Fred Prato.

Union Stockyards of Chicago has ir Lodestar in for custom interior allation. Appropriately, (they are the cattle business) interior is be-redecorated in calves' skin. AVQ-weather radar is being installed at uest of pilots Jack Allen and John rce.

Col. Alfredo Gemmel, Pres. of nmel & Associates, Inc., took de-ery of a new NA-75 Duster-rayer aircraft, manufactured by nerican Airmotive. The aircraft was ried by Aircraft Ferry, Inc. of Mi-i, to Guatemala.

Air Cargo Express, Inc., has or-ed a second C-46R which is now dergoing airline custom interior in-llation and painting. American rmotive is exclusive sales and con-sion agent for this Riddle Airlines gineered transport category air-ft.

Reeve Aleutian Airlines took de-ery of their Douglas DC-4 which d 8,000-hr overhaul, new airline in-ior and new paint job. END

A matter of family interest

Pratt & Whitney Aircraft has a "family interest" in what happens to its engines throughout their many years of operation.

When a Pratt & Whitney Aircraft engine leaves our plant it's as good as we can make it. It's built to stay that way if properly serviced, using replacement parts that are exactly the same as original parts.

We are concerned over recent reports of increased use of bogus* replacement parts and the potential hazard they present to the dependable and efficient operation of aircraft engines. Counterfeit parts are difficult to detect. They may look genuine but they may cause disaster.

As the booklet "The Problem of Bogus Parts", published by Flight Safety Foundation, Inc., points out, "Another reason for serious concern is that the airworthiness certificate of your aircraft may be suspended or revoked if bogus parts are used in its repair, overhaul or maintenance."

Protect yourself against the problem of bogus parts by specifying original manufacturer's parts, and by dealing with authorized distributors or reputable overhaul or maintenance agencies. Don't take chances by buying your spare parts from a source which doesn't have a family interest in your engine.

*"*The Problem of Bogus Parts," published by Flight Safety Foundation, Inc. A free copy of this informative booklet may be obtained by writing to Pratt & Whitney Aircraft, East Hartford 8, Connecticut, Attention: Service Manager.*

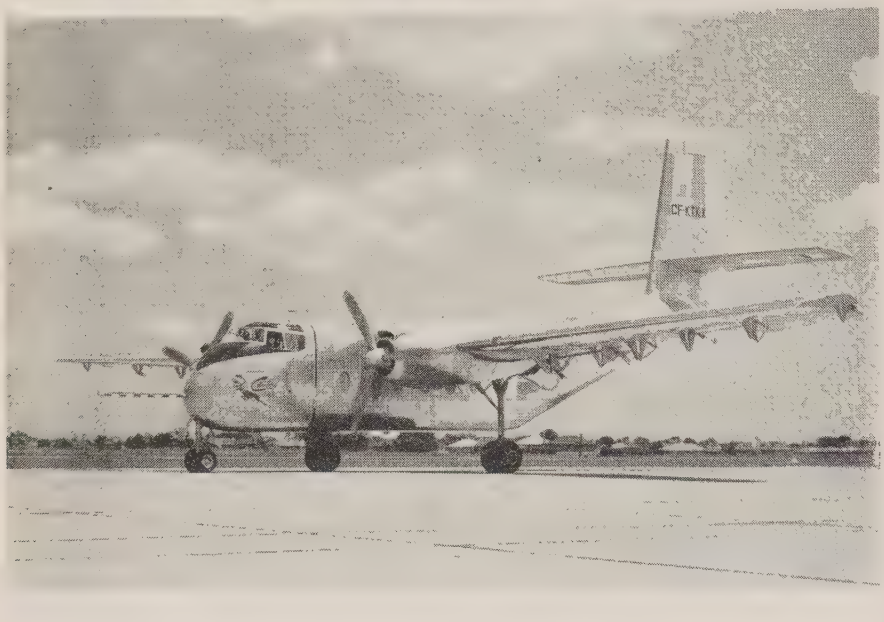
PRATT & WHITNEY AIRCRAFT
East Hartford, Connecticut

CANADIAN PRATT & WHITNEY AIRCRAFT CO., LTD.
Longueuil, P.Q., Canada

Circle No. 28 on Reader Service Card

CANADIAN REPORTS

North of the Border
By R. J. Childerhose



Caribou Unveiled

The deHavilland Aircraft of Canada Ltd., has taken the wraps off their new Short Take-off and Landing (STOL) aircraft, the DHC-4 Caribou. Undertaken in January 1957 as a design study, production of a prototype was begun in April. Fifteen months later the aircraft was airborne on its maiden flight. Basically, the Caribou is a high-wing, twin-engine cargo-passenger aircraft in the same weight classification as the DC3 but with the ability to take-off and land in a distance of 500 feet.

Powered by two Pratt & Whitney R2000 engines, the Caribou has a load capacity of 3½ tons. It is designed to take-off and clear a 50-foot obstacle in a distance of 840 feet in zero wind conditions. Given a headwind zephyr of 20 mph, it will clear the same obstacle in 460 feet. The landing distance over the 50-foot obstacle is 590 feet.

The prototype aircraft, which has logged over 100 hours of test flying, is being readied for certification trials. Two aircraft will be completed this year, and deliveries of five ordered by the U.S. Army will begin in February 1959. Present production plans call for an additional 15 of the utility craft to be built "on a speculation basis." Target date for the first civil model is March 1959. Proposed price tag is $495,000.

Said a de Havilland spokesman: "We do not visualize the Caribou as a passenger aircraft on scheduled runs. However, it will be of use to operators in the northland and to those corporation firms which require a cargo-carrying plane. We have had several enquiries from major oil companies already."

Large construction companies are also interested in the Caribou, since it can carry a large payload into relatively undeveloped areas. Features that make it attractive to this market are: its STOL ability; good ground handling characteristics; large rear loading door; monorail to facilitate handling heavy loads along the cabin length.

While the Caribou is designed to operate from short unpaved runways, it is capable of carrying much greater loads from runways of greater length. Where maximum take-off performance is not required, the gross weight of 24,000 lbs can be increased by a substantial amount. At its normal gross weight of 12 tons, the cargo payload will vary from 7,383 lbs with fuel for 200 miles, to 6,038 lbs with a 600-mile range. Maximum range with full standard tanks is 1,350 miles.

Cruising speed of the Caribou is 183 mph, at approximately 51% of take-off power. Touch-down landing speed is 60 mph; normal rate of climb at sea level is 1,500 fpm; single engine rate of climb, 315 fpm. Service ceiling is 24,900 ft.

The full span double flaps, and the large tail area provide excellent control and maneuverability, particularly for low-level, low-speed operations. A wide C of G range allows an unusual variety of cargo loading arrangements.

Designed in collaboration with leading test, military and airline pilots, the cockpit is functional and comprehensive. Instrumentation and electronic equipment duplication follows standard airline practice. Although designed for two-man crew operation, the Caribou can be handled by one pilot for short haul, high density operations.

Trim change with flap lowering is automatically compensated for. The landing roll is only 300 feet with a 10 mph headwind; this is made possible by the extra large flap surfaces and the power-assisted hydraulic brakes. A 3,000 psi system operates the flaps, nose wheel steering, landing gear and brakes.

The Pratt & Whitney R2000's, complete with propeller, reduction gear, accessories and cowlings, are fully interchangeable. The power plant fo ward of the firewall is identical. Cow ings are of the petal type to facilita engine inspection and maintenance.

The aircraft, its systems and equi ment have been designed to permit i spection and maintenance with limite facilities. The aircraft as a whole built to function over a wide scale ambient temperatures, ranging fro −40F° to +120°F. Provision has bee made for a winterization kit to exte the lower temperature range to −65° In addition, the aircraft and its equi ment have been designed to withsta temperatures of up to 160°F witho damage.

De Havilland of Canada have bee pioneers in the field of STOL aircra since 1947. Like its famous predece sors, the DHC2 Beaver and the DH Otter, the Caribou is a workhorse ai craft capable of many and varied mi sions. We expect it will be just successful.

Import of Used Aircraft

Little progress is being made wi proposals concerning the modificati of Canadian government regulatio that require a used aircraft to quali for a U.S. C of A for export before can be imported to Canada from t USA. In a recent letter of policy se to the Air Industries and Transp Assoc., the DoT stated:

". . . the Department's policy is pra tically unchanged with respect to t C of A for export requirements for t importation of used aircraft from t USA. In special circumstances we w allow used aircraft in an unairwort condition to be imported into Cana without the C of A for export, but will not automatically allow every us aircraft to enter without (one) . . Each case will be treated on its mer and will require prior approval fr the Department, which reserves t right to refuse any importation. Ge erally, however, if the circumstanc are reasonable, we will grant approva

Canadian importers of used aircra feel that the present regulations for them to have a lot of expensive wo carried out in U.S. shops which cou be given to Canadian firms.

Gulfstream Arrival Preparations

As Grumman Aircraft Corp., co tinues to build up hours on the Gu stream for certification, first deliver are scheduled for early in 1959. Ti mins Aviation Ltd., distributor for t new aircraft in Canada, are prepari personnel and facilities to fully acco modate and service the sleek turbopr

TAL personnel will train with Gru man, Rolls-Royce and Rotol Inc. Grumman representative will be p manently attached to TAL. Several C nadian companies have ordered t Gulfstream.

ɛs Make News

ɒert W. Dodd was promoted to osition of chief of the air traffic ɔl division of the Department of ɜport's air services. Mr. Dodd has an executive pilot with the DoT April 1, 1956. He joined the Deɹent in June 1955 as an inspector ril aviation.

S. Little, Jr., was appointed manof the head office aviation depart- Shell Oil Co. of Canada, Ltd. ɔceeds C. H. Stover, who has been ferred to the aviation department ell's New York office.

x Bowen, general manager of l Aircraft (Canada) Ltd., was d vice-president of the firm. Mr. n has been general manager of any since February 1956, when he transferred from the position as of the Dayton, Ohio, office of l Aircraft Corp. He has been with l since 1948, when he started as igner in the engineering division.

ry Sully was named manager of an Air Services (Quebec) Ltd., ec City, He also represents the any in Montreal and New York.

ɔn Alternate

ɔroposal which would open Mount Airport as an alternate field for ɹto Malton was received recently e city of Hamilton from the Trans- Department. The government ively proposes leasing the facili- t the former military airfield six south of Hamilton, to the city. e DoT is prepared to install an ɹment landing system at the field ɹke it available for landing day or , good weather or bad. Though uled airliners are the basic conɹtion here, it is felt that the growolume of executive business travel l benefit also.

e to the difference in field elevaɔetween the two neighboring cities, ɹt Hope is often clear when Tor- Malton is clamped with fog. At nt, Toronto-bound flights must be ted to Windsor, Ottawa or one veral American fields, all of which ɹore than 100 miles from Toronto. hilton to Toronto is roughly 40).

Erie Oil Survey

nadian Aero Service Ltd., recently leted the first Shoran-Controlled rne magnetometer survey to be in Canada. The survey was made ehalf of Canadian Kewanee Ltd., are currently exploring for oil and ɔeneath the waters of Lake Erie. aerial survey which covered an of 1100 square miles was comd early this year; the final maps delivered in October.

rcraft used in the survey was a which operated out of Windsor. Volkswagen trucks, specially ɔped with Shoran gear and masts, ioned as ground Shoran stations. trucks were parked at exactly n positions, both Shoran stations transmitted and received pulses from the Shoran unit in the aircraft. Use of this Shoran device enables the aircraft's flight path to be determined to within plus or minus 50 feet.

Maps compiled from data obtained by the magnetometer shows the contours of the earth's magnetic field. These maps have been interpreted by Canadian Aero's geophysical staff to indicate areas of structural interest and the depth of the Precambrian rocks. It is interesting to know that the survey revealed errors of 400 feet and more in the location of the lakeshore shown on the latest maps.

Canadair 540 Progress

The Eland turboprop version of the Convair 340 which is now in production in Canada as the Canadair 540, has been certificated by the CAA in the United States as suitable for all types of commercial operation.

Napier purchased this aircraft in the U.S. and, as a private venture, removed the piston engines and installed their own Eland 3,500 ehp propeller turbines. The aircraft was flown to California in November of last year to undertake trials. It is the first time that an aero-engine company has equipped an aircraft with its own powerplants and obtained for it an internationally accepted C of A for civil operation.

Napier and Canadair Ltd., who are in production of the aircraft, have embarked on a comprehensive sales tour of North and South America; later will go to Europe and elsewhere.

Cessna 310 on Survey

Spartan Air Services Ltd., has been awarded a 40,000 acre airphoto and mapping contract by the Federal District Commission to provide a framework for creation of a Green Belt around Ottawa, Canada's capital city.

The work is being done by one of Spartan's camera-equipped Cessna 310's from 6,000 feet.

The mapping will be done at the company's laboratory at a scale of 200 feet to the inch; with contour lines at five feet.

Flood of Charter Licences

Relaxation of the Canadian Government's policy on commercial licences for small (Group C) aircraft has brought a flood of license approvals from the Air Transport Board. The rash of licences has been mainly to small firms set up for chartering of light aircraft.

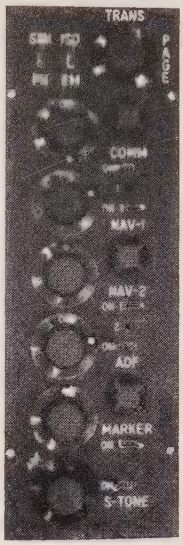
It is the result of a decision made by the government in July that it was in the public interest "that licences for air services using light aircraft and helicopters be granted on request."

Transport Minister George Hees said that the type of licence referred to in the new ruling covers only 3% of total traffic in Canada. There has been widespread criticism of the relaxation, and the new ruling has caused extreme consternation among smaller operators.

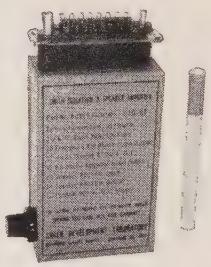
NOW FOR THE FIRST TIME

you can have a completely integrated unit to handle all of the audio functions of your radio equipment.

The Smith Audio System, with self-contained Transistorized Isolation and Speaker Amplifiers, has adequate power to drive the earphones or speakers in the noisiest cockpit with good, clean audio. Eliminates noise picked up by excessive wiring to remote amplifiers. Complete paging system directly under pilot's control. Miniaturized to the smallest size permitting adequate operating space. Can be mounted on the instrument panel or at a location easily reached and seen by the pilot. May be operated as separate, or dual units for one-, or two-pilot airplanes. Available in various models to meet pilot requirements. You have seen nothing like it! Write for complete information.



Smith Audio System is built in two panel sizes 2½" x 7½" and 2½" x 8½", each small enough to permit mounting in most convenient locations.



A self-contained unit slightly larger than a pack of king-size cigarettes.

Smith 10-Channel Transistorized Isolation and Speaker Amplifier

Designed for good, clear, noise-free audio. Miniaturized to the fullest extent, it brings the amplifier closer to the controls, eliminating the noise picked up by wires to a remote amplifier. This unit contains the isolation network, the two-stage isolation amplifier for earphone operator, and the power speaker amplifier. May be operated as separate, or dual units for one-, or two-pilot airplanes. Limits maximum signal level for more comfortable earphone operation —eliminates those ear-splitting blasts. Size overall 1-3/16" x 2⅞" x 4¾"; weight including connector 7¼ oz.; fuse size 0.175 amps (28-volt DC.)

SMITH
DEVELOPMENT LABORATORY
CLEVELAND HOPKINS AIRPORT
Mailing Address: P. O. Box 4731
CLEVELAND 26, OHIO

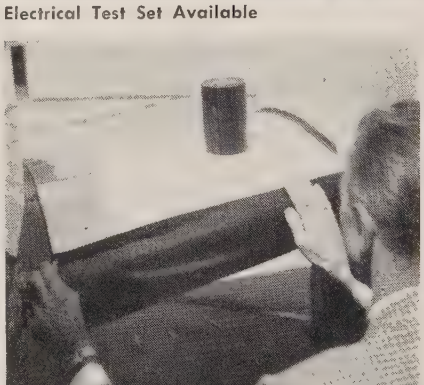
Circle No. 12 on Reader Service Card

Cold Weather Engine Heater

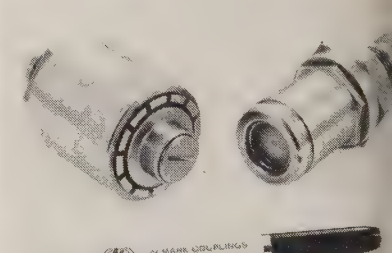
Electrical Test Set Available

Small Turbine Power Driver

New Flexible Hose Assemblies



Plastic Tape Protects Surfaces



Quick Disconnect Hose Coupling

nu-avi-quip

Cold Weather Engine Heater

A new portable aircraft ventilating heater will aid executive aircraft operators in starting and warming up airplane engines for winter flying.

Specially designed for large aircraft, the heater puts out 1,200 cfm of fresh heated air. A blower forces the heated air through spring reinforced insulated ducts. The unit weighs 110 lbs. and produces 180° F temperature rise at 2,000 rpm.

A modified dual port model permits either simultaneous warming of twin-engine aircraft or warming of engine and heating and ventilating of cabin. Ducts come in 15-ft lengths and are available in special sizes on order.

Reader Service Card No. 76

New Flexible Hose Assemblies

Nylon covered tygon hose assemblies with standard or special fittings are designed for use with oxygen and corrosive fluids and gases.

Burst pressures go to 2,000 psi and temperature range is from —68° to +215° F. The hose assemblies are light weight with extreme flexibility. Other uses for the hose include pneumatic instruments, test equipment, vacuum lines, pressurized liquid systems and ground handling equipment.

Reader Service Card No. 77

Electrical Test Set Available

Aircraft electrical and radio wiring can be checked with a new analyzer. The volt-ohm-milliammeter analyzer offers wide range test measurement.

Range and functional switching is simplified by the use of a single dial for all ranges and functions. It is housed in a black bakelite case. The analyzer measures 6¼" x 7½" x 3¼". Weight is 3 lbs.

Reader Service Card No. 78

Plastic Tape Protects Surfaces

A new vinyl plastic tape with high resistance to abrasion and strong pressure sensitive adhesion protects leading edges of wings, tail surfaces, loop housings and vertical masts from stones and other substances picked up by props as well as abrasive effects of rain and small ice pellets.

Protectape is available in black only in widths of 2, 4, 6 and 8 inches. Even on jets it has shown no indication of peeling or flaking under extreme high or low temperatures or high speed

Reader Service Card No. 79

Small Turbine Power Driver

Measuring 16" high and 13" w with a weight of 45 lbs is a new sm 30 shp gas turbine engine.

The turbine serves as a power d for generators, air compress blowers and other applications. aircraft applications the unit can erate from sea level to 20,000 f Output shaft speed is available either 6,000 or 8,000 rpm.

Reader Service Card No. 80

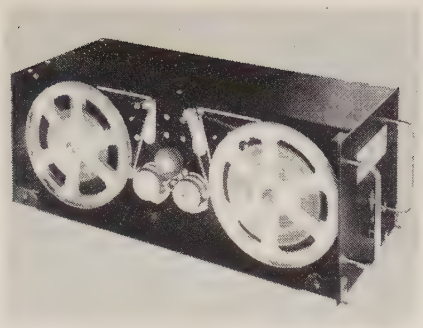
Quick Disconnect Hose Coupling

A fuel and hydraulic line quick connect coupling withstood 22,000 in a burst test, the manufacturer nounces.

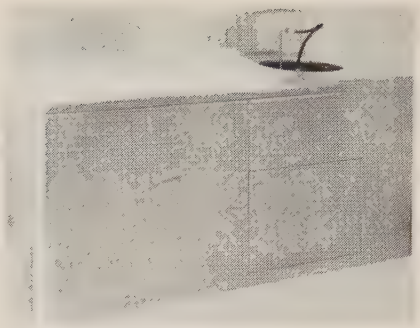
The coupling may be connected disconnected manually under h pressure simply by pushing the ha together or pulling back on the act ing ring. Locking mechanism is scribed as smooth and positive will compensate itself as wear occ End fitting may be altered to various applications.

Reader Service Card No. 81

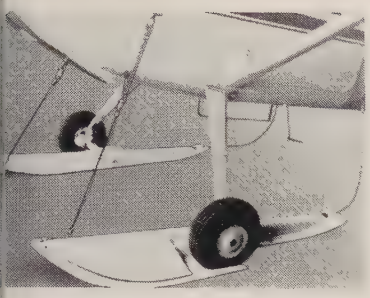
Watches Aid Pilots, Executives



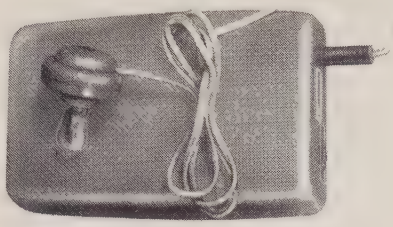
Recorded Background Music "Package"



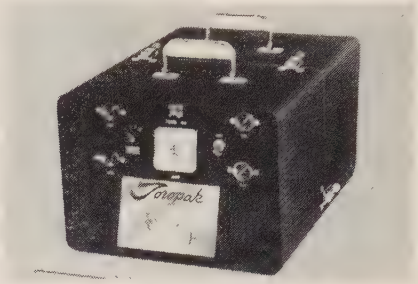
Bearing Cleaning Shop Aid



Aircraft Ski Introduced



Radar Beam Intensity Detector



Units Supply DC or AC Power

Watches Aid Pilots, Executives

wrist alarm watch is one of three s-made watches that offers some- unusual to the business pilot or itive who travels by company .

aperture in the dial gives the the alarm will ring, a feature cable to time-to-switch-tanks, -reminder, and similar uses. tiny bulb lights at the touch of a n to illuminate the dial of an- watch. A third watch gives two ent times simultaneously, has a n. dial for those ATC restrictions, alls. Also good for GMT needs.

Reader Service Card No. 82

Aircraft Ski Introduced

new ski, designed to utilize the oning effect of the tire to absorb of the shock of landings and off runs over rough, uneven snow aces, has been developed and ed "Airglide."

e tire rests on the upper surface e ski when the ski is "down."

e ski is hydraulically controlled the cockpit so that it can be d or lowered while in flight or on ground enabling the pilot to land keoff on either skis or wheels.

e "Airglide" is also available out hydraulic controls.

Reader Service Card No. 83

rded Background Music

help the flying executive and ess plane passenger relax is a ally arranged tape recording c program.

e programs are designed to pro- a pleasant background to al- te tension, boredom and fatigue. playback machine is built to NC specifications, fits a standard rack, weighs 28 lbs and measures × 10½" × 8" with cover.

Reader Service Card No. 84

Radar Beam Intensity Detector

A shirt-pocket size detector of dangerous high-intensity radar beams is available for warning aircraft radar maintenance personnel, engineers and technicians when in the beam.

The small detector has a neon light and earphone, both of which give ample warning to personnel before exposure to the dangerous radar beams becomes a critical hazard.

Intensity of the sound in the earphone depends on proximity to the radar transmitter. It can detect a powerful operating radar one-half mile away.

Reader Service Card No. 85

Bearing Cleaning Shop Aid

A new bearing cleaning center is designed to de-preserve and clean all types and sizes of bearings.

Automatic cycling permits thorough washing and drying with a single loading, the manufacturer says. The wash and dry cycles are automatically controlled by a sequence timer with adjustable automatic cycling.

Other features include interchangeable heads with capacity of one to eight bearings for each cycle, self contained fluid and air filters and self contained hot oil de-preserving unit with spray rinse for pre-cleaning.

Reader Service Card No. 86

De-fueling Hose Nozzle

A flexible nozzle for aircraft de-fueling hose has been developed.

Because aircraft destined for short trips are frequently de-fueled to lighten the plane, the flexible nozzle was developed. It has a wall of rubber reinforced with fabric and spirally-wound wire. The end of the nozzle is fitted with a semi-hard tapered rubber stem which slips easily into fuel tanks.

Reader Service Card No. 89

Units Supply DC or AC Power

A series of new product units are engineered to supply DC or AC power where none exists or for emergencies during power failures.

The unit supplies 110 volt, 60 cycle single phase power up to 200 watts continuous output for eight hours or more. It will also provide 12 volts DC current for an extended period.

Reader Service Card No. 87

"Customized" Blind Flying Kit

A blind flying kit for instrument instruction features pre-trimmed and shaped amber vinylite panels which cover the windshield and side windows of current exec and private aircraft.

The pilot taking instruction wears blue lens goggles, furnished with the kit, which permit clear viewing of the panel instruments but completely block outside vision through the amber panels.

Reader Service Card No. 88

Sacro-Ease Posture Seat

An adjustable posture seat reduces backache and fatigue, holds the individual in proper posture, increases his comfort and keeps him more alert.

These were the conclusions derived from a six-month operational test by a group of taxicab drivers. The same results and application can be applied to aircraft pilots.

Sacro-Ease seats were designed to the principle of proper distribution of body weight. The seat part is a patented one-piece sleeve of latex rubber suspended on a ⅛" frame of special high carbon tool steel. The gripping quality of the rubber forces the body to an erect and comfortable position, the manufacturer claims. The adjustable back rest braces the small of the back, providing support for the entire spine.

Reader Service Card No. 90

Modernize your TWIN BEECH into a DeLuxe-18

Give your ship that . . . Airline look!

Custom Manufacturers of . . .

* The Power Step
* De Luxe Card Table
* Jet Nose Cone
* Luxury Divan
* Reclining Easy Chair
* Straight Line interior Kit
* Other Conversion Items

Send for Catalogue No. 383 on modernizing the Twin Beech.

It's Safer! Reduce fire, damage or re-covering problems by converting your control surfaces from fabric to metal. C.A.A. - S.T.C. Fly-in exchange also available

Airline Products Company

5536 Satsuma Avenue, North Hollywood, Calif. Phone: POplar 1-1732 Cable: AIRLINE, NO. HOLLYWOOD

Circle No. 29 on Reader Service Card

Case In Point

(Continued from page 13)

radial to the intersection of the Lubbock VOR 278°T (267°M) radial (redesignated Caprock Intersection), thence via the Lubbock VOR 278°T (267°M) radial to Lubbock.

E. VOR Civil Airway 60 from the Texico, Texas VOR to the Lubbock, Texas VOR via the Texico VOR 122°T (111°M) radial and the Lubbock VOR 008°T (357°M) radial.

F. VOR Civil Airway 62 from the Texico, Texas VOR to the Lubbock, Texas VOR via the Texico VOR 122°T (111°M) radial and the Lubbock VOR 008°T (357°M) radial.

G. VOR Civil Airway 280 between the Roswell, New Mexico VOR and the Texico, Texas VOR via the Roswell VOR 080°T (068°M) radial and the Texico VOR 216°T (204°M) radial.

5. *Proposed Designation of "Reserved Areas"*—The CAA requests airspace approval for the designation of the following "reserved areas": (See Cover)

A. *Reese Air Force Base (North)*

From	33°	50′	45″	N	102°	24′	30″ W
To	33	53	45		103	02	45
To	34	01	15		103	02	45

Thence counterclockwise via an arc the radius of which is 26½ nautical miles (30 statute miles) from the Cannon, New Mexico VOR.

To	34°	23′	00″	N	102°	47′	45″ W
To	34	00	30		102	07	00

Thence counterclockwise via an arc the radius of which is 22 nautical miles from the Lubbock, Texas L/MF radio range.

To Point of Beginning.

B. *Webb AIR Force Base (South)*

From	31°	29′	45″	N	101°	00′	00″ W
To	31	10	15		101	00	00
To	30	52	30		101	31	30
To	31	01	30		102	54	45
To	31	24	00		103	01	00
To	31	34	15		102	39	00
To	31	31	30		102	11	45
To	31	46	00		101	44	45

To Point of Beginning.

C. *Joint Webb and Reese Air Force Bases*

From	32°	30′	45″	N	100°	28′	00″ W
To	32	28	00		101	12	15

Thence counterclockwise via an arc the radius of which is 15 nautical miles from the Big Spring, Texas VOR,

To	32°	31′	30″	N	101°	43′	45″ W
To	32	37	00		101	59	00
To	33	27	00		101	52	00
To	33	26	30		101	39	00
To	33	32	00		101	22	30
To	33	26	00		100	43	00
To	33	07	00		100	28	00

To Point of Beginning.

D. *Reese Air Force Base (West)*

From	33°	37′	15″	N	102°	01′	30″ W
To	33	01	30		102	07	00
To	32	57	00		102	34	00
To	32	57	00		102	50	00
To	33	00	00		103	33	30
To	33	06	30		103	48	00
To	33	22	45		103	48	00
To	33	23	30		103	42	30
To	33	46	15		103	22	30

To Point of Beginning.

E. *Webb Air Force Base (West)*

From	32°	17′	15″	N	102°	24′	45″ W
To	32	20	45		102	15	00
To	32	50	30		102	11	00
To	32	42	30		102	46	15
To	32	36	15		102	46	15

To Point of Beginning.

F. The number of aircraft, sorties and types of training activities to be conducted in each of these areas are as follows:

1. *Webb AFB*

South Area—Eighty sorties per day performing formation work

West Area —Twenty-one sorties per day performing basic instrument work

Joint Webb/Reese Area —Seventy-one sorties per day performing r instrument type w
—Ninety-two sorties day performing tra tion work
—Eleven test flights day
—Twenty-six sorties various types of w on a check-flight ture.

In addition to the above, it is pected that Webb will generate appr mately twenty-seven sorties per day forming navigation training work w will operate at altitude in all the served areas.

It is expected that, based on a day training cycle, Webb AFB generate a total of 328 Sorties per 316 of which will use T-33 type craft, while 12 will use F-86L's.

2. *Reese AFB*

This base will begin student t ing in September 1958, and it is pected that the training program develop during the next two year the maximum number of sorties outl below. These figures do not inc night flying, the majority of which be accomplished in the vicinity of Base. T-33 type aircraft will be in the beginning, possibly repl with T-38's later in the program.

Northwest Area—Sixty sorties per performing in ment training w

Southwest Area—Sixty sorties per performing forma work
—Eighty sorties per performing trans and acrobatic

Joint Webb/Reese Area —Forty sorties day perfor instrument t ing work.

(Special Chart—RF-26, 29 & 30
(WAC 406-407-469-470)

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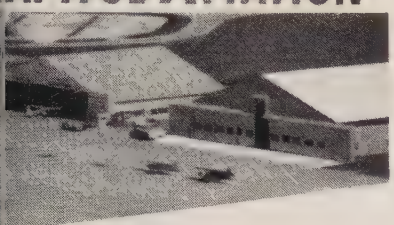

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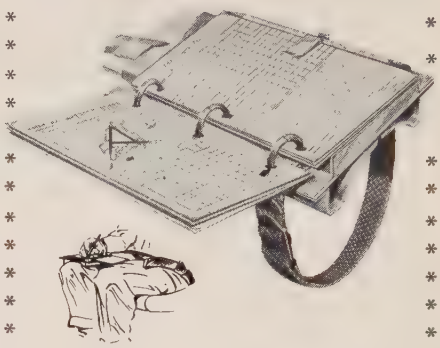

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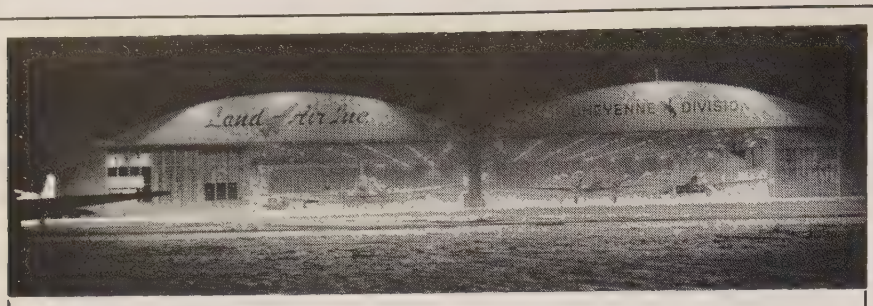

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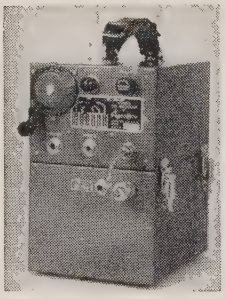

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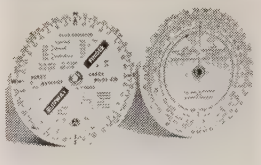

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1957 model, 330 total hours. Save the loss of factory price depreciation. Immediate delivery at $69,000. Original $138,000. A.R.C. lightweight ADF, dual omni with Course Director, Sapphire VHF transceiver, glide slope, marker, speakers, etc., air conditioner, heater, Hartzell full-feathering props, 230 fuel capacity, couch, writing table, oxygen, stall warning, two electric boost pumps, two vacuum pumps, two 100 ampere generators, etc. Traded in on executive Super-92 DC3.

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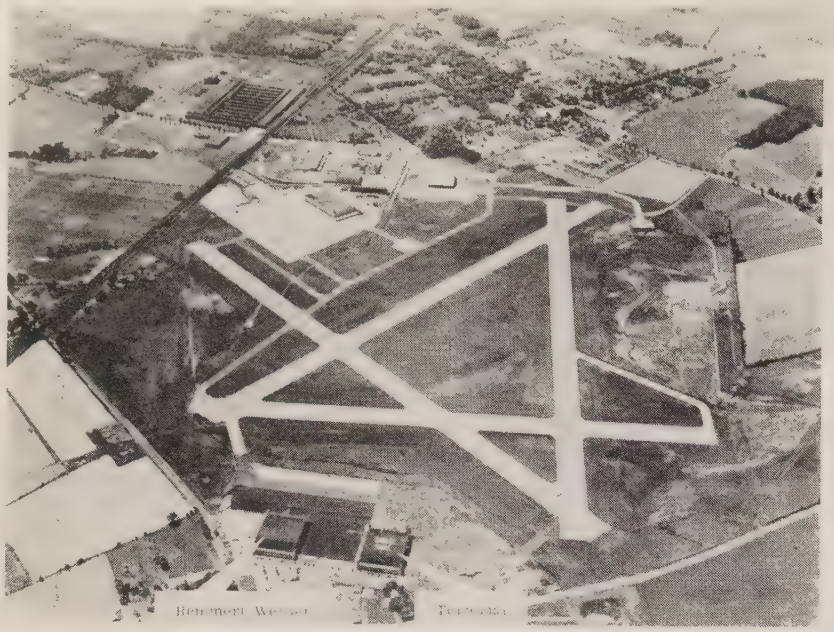

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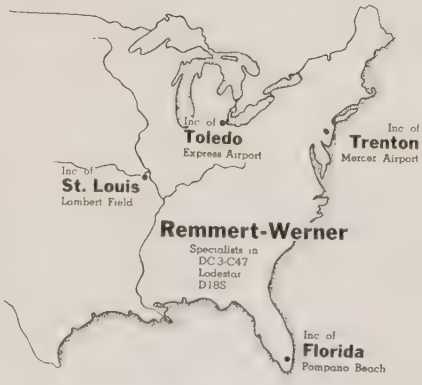

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Maintenance Bulletin

These maintenance notes are compiled and edited from recent CAA air carrier maintenance branch, general aviation maintenance summaries and business aircraft operator reports, and are mailed to all NBAA members as part of their membership service.

Commander

680—*Landing Gear Drag Strut*—Inspection disclosed cracks ap- g in inboard section of right g gear drag strut truss. Inspec- f corresponding areas disclosed gles having rivets "working".

craft

D18S—*Battery Solenoid Fail-* his failure was evidenced by the crew with the loss of all electrical ment as the engine RPM got that necessary for generator out- he faulty solenoid was replaced. embly of the unit revealed that il windings had separated at the al due to corrosion. This corro- was caused by water leaking d the battery compartment cover in flight or during ground wash- the aircraft. Other Beech instal- s showed similar signs of corro- A policy of disassembling the re- and sealing with EC612 before ation was adopted. (NBAA Oper- Report).

a

1 170B—*Brake Disc Retainer Clip lyear Wheel P/N-5306595)*—In- ative findings attributed an ac- to a locking brake, resulting failure of the left brake retainer and consequently jamming in the mechanism. Goodyear Service AP-53, dated July 15, 1954, pro- for installation of a disc retaining kit to prevent this type failure.

del 310—*Landing Gear Retract- Link P/N-0841102-4*—Links on landing gears were found cracked oximity to upper end.

air

el 340—*Ground fire in No. 1 e augmentor tubes.* Investigation ates that the augmentor tube vanes inadvertently closed by persons own while the engine was running.

las

el DC-3—A number of flights were where the pilot experienced in- ttent roughness of the right en- but could not pinpoint it due to the duration of the roughness. All d checks were made and disclosed ng significant. An engine analyzer nstalled and the ship test hopped. s found that numbers 12 and 14 ders showed a breakdown of the on pattern and the trouble was d to a collapsed intake valve and ht exhaust valve. Both cylinders changed; the trouble was cor- d and the case closed. (NBAA ator Report).

del DC-3—During routine inspection, metal found in screen of left engine. Engine changed, TSO 41:20. Engine, S/N 439764. Engine recently purchased, returned to West Coast Sales and Service Co., Seattle, on warantee. Tear-down inspection revealed No. 1 piston pin plug, "Bogus part" failed. Part inadvertently installed in engine. No other damage evident. Repair station agency advised that similar plugs in stock returned to vendor.

Grumman

Model G-21A—At end of roll after landing, right wheel seized. Excessive drag resulted in extreme difficulty in taxiing. Inboard wheel bearing cone, P/N 39250, was found to be missing. Bearing had been omitted when right wheel was replaced account of defective tire. Wheel was inspected subsequent to installation, however, due to construction of wheel and brake assembly this omission cannot be detected by visual inspection or normal operational checks without disassembly. Cause of difficulty was personnel error.

Lockheed

Model L-18-08—Upon lowering the gear on approach, the pilot noted that the left gear green light was not on. A check was made to determine if the indicator bulb was burned out. It was found to be OK and further checks indicated that the gear was full down and locked. After landing, the ship was checked and found that the mechanical down lock micro switch was sticking. The replacement switch used a protective rubber boot to keep the dirt off the slide. (NBAA Operator Report).

Model 18—*With "CAPO" Tail Wheel Lock Assembly*—Service reports from the field indicate that a condition of lock jamming can happen.

No trouble has developed from flight operation, but is a direct result of improper handling by the ground crew.

Damage occurs when the ground crew releases the tail wheel lock and the lock does not completely disengage and tow bar pull applies a side load to the lock.

This tow bar side load can distort or crack the casting. If the casting is distorted it will not allow the cone to properly seat in the lock ring, thus permitting a condition of excessive shimming shearing the screw and allowing the cone to jam between the ring and the casting.

Therefore, it is imperative that the cone P/N 152-0341 be removed at once and cut down from the small end to a maximum dimension of .240" —.245" thick. The shear screw must also be ground flush with the cone and staked in place for proper operation.

If after this revision to the cone the tail lock does not lock or hold it indicates prior damage to the casting. Under these conditions the strut should be returned to the factory for replacement of castings.

If no facilities are available to do this machining, we would be glad to furnish you with the new cut down cone. (Wise Aerodraulics, Inc. Service Bulletin)

Piper

Model PA-23—*Neck Assembly (Fuel Cell Filler)*—Difficulty was encountered during flight in heavy rain. Inspection disclosed water in fuel cell, attributed to ring which surrounds filler separating at neck assembly.

Nosewheel Well Door Actuating Tube Assembly—Difficulty was encountered when the actuating tube moved from the bearing blocks, resulting in inadequate door operation.

GENERAL

Liquid Agent Cartridges—Electrical Continuity—Walter Kidde and Co., Inc., cautions that special care must be taken in installation of liquid agent cartridges in the CB system to be sure that electrical continuity exists to the cartridge terminal.

Dimensional tolerances between cartridge solder terminal and the contact point are quite close. Once the solder terminal has been indented by the contact point, disassembly and reassembly introduces the possibility of unsatisfactory contact. Interchanging of the cartridges is most apt to cause such malfunction.

The Kidde company recommends continuity check during inspection by use of a G.E. No. 1819 lamp (or equivalent) in series with a 24-28-volt DC source. This limits the current through the cartridge to maximum of 0.035 amperes, the maximum safe testing current. This test may be made in the airplane or in bench-check. If not installed on the airplane, the cartridge must be securely held in a suitable fixture (projectile pointing away from all personnel), in case of accidental firing.

Engine Oil Tank—Cleaning—Use of carbon tetrachloride for cleaning engine oil tanks has been reported. Convair does not recommend using carbon tetrachloride, because it is toxic to personnel and because any moisture combined with it tends to result in formation of hydrochloric acid.

In the plant, Convair uses Stoddard solvent (specification P-S-661), followed by vapor degreasing. It is suggested for field use, Stoddard solvent or naphtha be used for removing grease and dirt. Either is likely to leave a film; a small amount of a chlorinated solvent

(trichloroethylene or dichloroethylene, for example) will remove the film. MEK, while an efficient solvent, is not recommended because of the risk of explosion when it is used for washing interiors.

If water is used, either as water or in steam cleaning, extra precautions should be taken to be sure that all traces of water are removed before tank is serviced with oil. (CONVAIR SERVICE NEWSLETTER)

Weather Radar—Discussions brought out fact that Weather Radar interference which had been noted in some aircraft in Glide Slope receivers was not due to the actual radiated RF from the radar antenna but actually was due to the shadowing effect of the radar dish in front of the Glide Slope antenna. (AEEC MTG.)

Tube Flaring—Instances reported failures occurring at the flare tube ends of fuel, oil, and hydraulic lines. In some cases, these failures have been attributed to repairmen using a commercial 45 degree flaring tool in preparing aluminum or copper tubing for installation of an AN fitting having a 37 degree flare angle. During the flaring operation, the tube is somewhat "work hardened." This condition is further aggravated when tightening the fitting nut because of the difference in flare angle of the fitting and the tube end flare.

Simple Dimple Crimples—Sometimes aircraft incur minor damage "jes sittin" in the hangar or on the airport apron. Basic cause, aside from carelessness, is movement of aircraft within the limited area of a hangar or a parking apron. Very often this type damage is "brushed off" by the offending plane handler as a mere bump or a slight scratch of too little consequence to need mentioning. But if pitot tube, for example, took the bump, consequences could be serious. A small dimple in the vicinity of a static source can throw off altimeter and airspeed readings. Such mishaps can cause fatal accidents. Here errors of omission prove greater than those of commission. (APPROACH)

Cleaning Gasoline Tanks—For safety, recommended standard practice before cleaning gasoline tanks should include following steps:

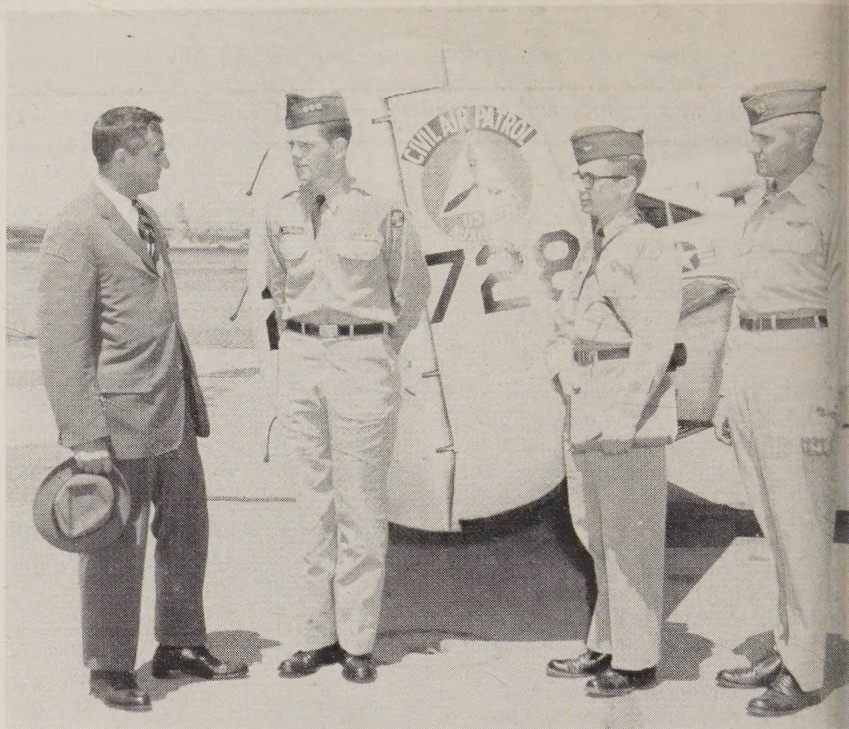
Aerate the tank by placing the suction end of a strong exhausting device as far as possible within the tank. Continue for at least a half hour or until a standard explosive meter shows no explosive concentration of vapor.

Mop as much as possible from outside the tank with long-handled mops, and with the suction still on. Only organic type cartridge respirators will be required for this.

All activities concerned with cleaning gas tanks, aircraft or otherwise, should have the necessary respiratory protection equipment as well as other accessories such as safety lights, gloves and coveralls. Breathing gasoline fumes has been known to result in fatalities. (APPROACH)

—YOU ARE INVITED TO USE THIS BULLETIN AS AN EXCHANGE MEDIUM—

NBAA Member Boosts Aviation Future With Scholarships for CAP Ca



SCHOLARSHIP WINNERS *are greeted on arrival at Bolling AFB, Washington, D.C., Carleton Barlow (left), director of Personnel Development for General Dynamics (Con Div. is NBAA member). The Civil Air Patrol Cadets, James I. Cochrane (left) of C lotte, N.C., and Eric E. Therkelsen of Ypsilanti, Mich., were flown to Bolling by C Kenneth Rowe, USAF-CAP liaison officer, Delaware Wing. The two scholarship are of 12 provided by General Dynamics for outstanding CAP cadets who are students in technical or scientific fields which will contribute to the advancement of aviation. The sen is attending Univ. of Wash.; Cochrane, Georgia Inst. of Technology.*

Indicative of the growing importance of developing interest of youth in aviation is the attitude taken by General Dynamics with their Civil Air Patrol cadet scholarship program.

The aviation industry particularly is keen on seeing more and more young people develop a lasting and, ultimately, participating interest in aviation.

Not only is industry bent upon this aim, but also the U.S. Air Force. The latter's volunteer civilian auxiliary, Civil Air Patrol, emphasizes its cadet program for boys and girls from ages 14 to 21 as much as it does the search and rescue work performed by senior members in their own planes and on their own valuable time. Many business plane pilots and business plane owners are members of this organization which performs some 70% of air search work at the direction of the Air Force's Air Rescue Service. The only reimbursement is the fuel used on such "official" missions.

The cadet program includes a variety of activities. An aviation education effort has resulted in a series of seven texts supplemented by workbooks, instructor guides and color film strips. By the end of 1957, 17,000 sets of the textbooks were being used by CAP squadrons and 289 high school aviation education classes throughout the nation.

Cadets participate in annual encampments held at Air Force bases, they make up drill teams for competition and the "cream of the crop" of cadets is selected to take part in annual International Cadet Exch with foreign nations. The drill te compete for national honors and top team of the country compete the annual International Drill Co tition with the Air Cadet League Canada.

A most important "by-product" this CAP activity is the combattin juvenile delinquency.

Greenhouse Patter

(Continued from page 41)

you want an Apache or Comanche livered to Italy, Conrad will do the for a flat $2500. Worth every pe sez I.

Maybe someday soon it will be rage to fly one's own plane to Eur Maybe a breakfast fly-in to P Pigalle or a weekend with the Rain at Carlo. Zounds! It will open a w new field of endeavour. The Navy be busy searching for, and the C Guard plucking out, our salt soaked intrepid amateurs who ran out of looking for Howard Johnson's ocean. Max Karant will have a w new set of glass houses at whic throw stones and our American hun will be winging westward with el African deer and tiger over the nace

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This new T/R unit, when used with the new Bendix 18-inch stabilized antenna, reduces the total system equipment weight to 82 pounds. (With 22- and 30-inch antennas, total system weight is approximately 91 pounds.)

Because of its lighter weight, smaller size, reduced power requirement, and increased performance, Bendix Weather Radar is recommended by FAIRCHILD for installation in the F-27.

For further information, write Bendix Radio Division, Aviation Electronic Products, Baltimore 4, Md. Export: Bendix International Div., 205 E. 42nd Street, New York 17, N. Y. Canada: Computing Devices of Canada, Ltd., Box 508, Ottawa 4, Ontario.

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